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### THE VALUE OF THE VAN DEN BERGH REACTION IN THE CLINICAL STUDY OF JAUNDICE.

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THE trend of recent work on diseases of the liver has been greatly influenced by the transition of modern medicine, as Rolleston<sup>(1)</sup> has expressed it, "from the era of physical signs to that of functional disorder." Jaundice especially has been intensively studied not merely as a simple pigmentary phenomenon, but rather as an evidence of disturbance of one of the numerous and complex functions of the liver. New tests, notably those of Van den Bergh and Fouchet, have been devised for the detection of the changes in the bilirubin content of the blood which precede and underlie the grosser icteric manifestations. To render intelligible the analysis of results of the Van den Bergh test and their clinical significance embodied in this paper, a brief discussion of the principles of the test and the new conception of the mechanism of production of jaundice which has resulted from its use, is first presented.

### THE VAN DEN BERGH TEST.

The changed outlook which has resulted from the recognition of the importance of the blood changes in the icteric state, may be illustrated by a comparison of the definitions of jaundice in two classical monographs published almost thirty years apart. To Murchison,<sup>(2)</sup> writing in 1877, jaundice signified "a yellowness of the integuments and conjunctivæ and of the tissues and secretions generally, from impregnation with bile pigment." But Rolleston<sup>(3)</sup> in 1905 accepts it as "due to the presence of bile pigment in the blood, recognized clinically by staining of the skin, conjunctivæ, mucous membranes, blood stream and, as a rule, of the urine, by bile pigment." It is, however, during the past decade only that research has been directed to the changes in the blood rather than to the external manifestations.

Isolated observations were made from 1912 onwards and in 1916 and 1917 Hoover and Blankenhorn<sup>(4)</sup> published communications of some importance in this connexion. But it is to Van den Bergh<sup>(5)</sup> whose work was summarized in a monograph published in 1918, that we owe most of our knowledge. The principles of the test which now bears his name, have been concisely stated by McNee<sup>(6)</sup> as follows:

Van den Bergh was met with the difficulty of finding a suitable qualitative and quantitative test for bili-

rubin in an albuminous fluid such as blood serum. He investigated many methods which had been employed for this purpose, but found none of them satisfactory or practical for clinical purposes until he virtually rediscovered the colour reaction given by bilirubin with the diazo reagent of Ehrlich. He found that this reaction solved his difficulties and gave him an accurate test for small amounts of bilirubin in small amounts of serum. With regard to the delicacy of the test, he found that a solution of 1 in 1,500,000 of pure bilirubin dissolved in alcohol still gives a positive result. Biliverdin and other yellow substances which may rarely be present in human serum and at first sight imitate bilirubin, do not give the reaction. Next, Van den Bergh made the original and important observation that in some cases of jaundice it is unnecessary to bring the bilirubin into alcoholic solution, but that a positive coupling, with production of the azo-dye, can be obtained by adding the diazo reagent direct to the icteric serum.

In this way he was able at once to divide icteric sera into two groups:

1. Sera giving a colour reaction at once (maximal within 30 seconds) on the addition of diazo reagent directly to the serum—Van den Bergh's prompt (or immediate) direct reaction.

2. Sera giving no colour reaction or only after long delay, on the addition of diazo reagent direct to the serum—Van den Bergh's delayed direct reaction.

Every icteric serum gives an immediate colour reaction with the diazo reagent after precipitation with alcohol so as to bring the bile into alcoholic solution. The application of the method to this alcoholic solution of bilirubin, derived from the serum, is known as Van den Bergh's indirect reaction.

The indirect reaction is utilized for the quantitative estimation of bilirubin in the serum. Full details of the technique are given by McNee. This we have followed closely, except that we have described as prompt direct reactions those appearing within one minute instead of thirty seconds.

It is evident, therefore, that bilirubin in jaundiced serum occurs in two forms which differ in their reactions to the diazo reagent. Since the publication of Van den Bergh's work it has been found that a third reaction occurs, some samples of serum giving a prompt colouration which is intensified after a definite, though variable, time interval; this has been named the biphasic reaction. The significance of these different results has not yet been clearly established, but it can be stated that in cases of complete obstructive jaundice the development of colour is always prompt and in hæmolytic jaundice it is always delayed. The biphasic reaction indicates that both forms of bilirubin are present in the serum, but its clinical interpretation is as yet obscure. Recently Fouchet has devised another test for bilirubinæmia which is simple and easily applied, but is not applicable to quantitative estimations. His reagent consists of: Trichloroacetic acid (five grammes), 10% ferric chloride solution, (two cubic centimetres), distilled water (twenty cubic centimetres). The test is performed by adding two drops of this solution to two drops of serum; if excess of bilirubin is present a green colour develops in within five minutes. By its use minor grades of jaundice, unrecognizable by ordinary clinical means, can readily be detected. We have used Fouchet's test in all the later cases in our series; the results will be discussed and compared with those given by Van den Bergh's method.

#### THE MECHANISM OF THE PRODUCTION OF JAUNDICE: EVOLUTION OF THE "MODERN" HYPOTHESIS.

During the past hundred years speculations as to the causation of jaundice have been advanced in such number that it would be impossible to discuss them in detail. The changing attitude may, however, be traced by reference to the views propounded by authoritative writers at different periods. Burder, writing in 1834, considered jaundice to be due in every case to obstruction of the larger ducts. Recognizing, however, that such obstruction could not always be demonstrated, he mentions the hypothesis of "spasmodic jaundice," only to dismiss it on the ground that there is no evidence of its existence. After the publication in 1847 of Virchow's classical work on the bile pigments the view gained ground, especially on the Continent, that a true hæmolytic jaundice could occur in the absence of obstruction and independent of the action of the liver cells. But Murchison in 1877, while recognizing that non-obstructive jaundice does occur, stipulated that the action of the liver cells was essential for its production. The experiments of Minkowski and Naunyn in 1886 appeared to give practical support to Murchison's view and for many years the conception of an-hepatogenous jaundice was discredited. So that Rolleston<sup>(3)</sup> in 1905 in discussing the mechanism of production of jaundice, spoke of "the common and essential factor being obstruction at some point to the passage of bile along the capillaries or ducts." This explanation was strengthened by the publication three years later of Eppinger's work on biliary thrombi. But interest in the possibility that jaundice might be purely hæmolytic was soon re-awakened and by 1912, as Rolleston put it in the second edition of his work, "opinion was inclining to the view that jaundice may in certain conditions be independent of any obstruction in the biliary apparatus and truly hæmolytic in origin." This sudden change of view was due mainly to the new conception of the functions of the reticulo-endothelial system put forward by Aschoff, to Whipple's apparently successful attempt to produce jaundice in animals which were the subject of experiment, when the liver had been entirely excluded from the circulation and to Pearce's work on the spleen and its relation to hæmolysis. The more accurate methods of detecting the slighter changes in the blood introduced by Van den Bergh have amplified their results and have led directly to the formulation of the new hypothesis of the mechanism of jaundice.

Briefly and somewhat dogmatically stated, this "modern theory," as McNee has named it, is as follows: The breakdown of hæmoglobin occurs chiefly in the cells of the reticulo-endothelial system, especially those in the spleen and in the liver, where they are known as Kupfer cells. Whether bilirubin itself or only one of its precursors is formed in these cells has not yet been determined. The hepatic glandular cells, however, do not seem to have the power of synthesizing bilirubin; they apparently only pick up from the portal blood in the hepatic capillaries bilirubin formed elsewhere and transfer it to the bile ducts.

In some way, not yet clearly elucidated, the pigment is modified chemically in its passage through the liver cells and it is supposed that the bilirubin in the serum gives a prompt or a delayed Van den Bergh reaction according as it has or has not undergone this chemical alteration. Jaundice might then conceivably occur in one of three ways:

In the first place it may be caused by obstruction of the bile ducts. Bile pigment, formed in the cells of the reticulo-endothelial system or elsewhere, having traversed the glandular cells to reach the ducts, cannot pass into the intestine and is re-absorbed, probably directly, into the blood stream. In this instance a prompt direct reaction would be obtained.

Secondly, it might be the result of excessive hæmolysis. More pigment is presented to the liver cells than can be dealt with. Some of it, however, is taken up and transferred to the ducts in the normal way and, passing out into the intestine, plays no part in the production of jaundice. The remainder which the glandular cells cannot deal with, passes directly into the general circulation through the hepatic vein and is responsible for the jaundice. This fraction which has not been altered by passage through the glandular cells, differs chemically from the pigment found with gross obstruction and reacts differently with the diazo reagent, giving a delayed direct reaction. Jaundice in which the pigment has the same chemical characters, might arise in conditions in which, though blood destruction is not excessive, the glandular cells through functional derangement are not able to take up the normal amount of pigment presented to them.

Thirdly, jaundice might be the result of a combination of obstruction and excessive hæmolysis or functional derangement of the liver cells due to the action of chemical or microbic toxins. Under these circumstances both varieties of bilirubin would be found in the serum and a biphasic reaction would then occur.

It must be emphasized that the data upon which this hypothesis rests, are by no means satisfactorily established. For instance, the experimental evidence as to whether bilirubin can be formed when the liver is completely excluded from the circulation is conflicting. The relationship of the more important pigments, especially bilirubin and urobilin, is at present the subject of lively debate. Nevertheless the new hypothesis, insecure as its basis may be, is more satisfactory than any other yet advanced, not only from the clinical point of view, but because it emphasizes the fact that jaundice is not a mechanical phenomenon only, but is often significant of functional derangement of the liver cells. It has, therefore, been adopted as a basis for the analysis of results presented in this paper.

#### ANALYSIS OF RESULTS.

As soon as the technique of the Van den Bergh test was published in McNee's<sup>(7)</sup> first paper on the subject, Dr. Patterson, then director of the Walter and Eliza Hall Institute, and one of us (M.C.) commenced an investigation of its practical

application. After Dr. Patterson's departure for England the work was continued and, as many specimens of serum have now been examined, it was thought that an analysis of the results should be attempted. To this end we have employed the data obtained in one hundred and fifty consecutive cases in which the use of the test was prompted either by the presence of jaundice or the suspicion of hepatic derangement without clinically recognizable icterus. In attempting to establish the significance of the findings, however, we have utilized only those in which the diagnosis was confirmed either by unimpeachable clinical evidence or by the findings at operation or autopsy. As a result, the number of cases illustrating each point is small, but the evidence they afford is reliable. We have approached the analysis from two points of view: First, as to the significance of the three types of response and, secondly, as to the interpretation of the results in individual diseases or in groups of allied pathological conditions.

#### The Bilirubin Content of Normal Serum.

The serum of eleven healthy persons has been examined as controls. All of them gave delayed direct reactions, the amount of bilirubin varying from 0.6 to 0.8 unit, except in one instance in which the figure was one unit. McNee quotes Van den Bergh as stating that 0.2 to 0.5 unit is the normal physiological limit, though in the serum of some healthy individuals of sallow complexion as much as three units may be present. We have found no figure higher than one in any of our normal controls and though our series is too small to justify definite conclusions, we would tentatively regard this as the upper physiological limit. The finding of a bilirubin value higher than one unit must always give rise to suspicion of liver derangement.

In this connexion the question naturally arises as to what is the "clinical threshold" of jaundice; that is, what degree of bilirubinæmia gives rise to jaundice detectable by ordinary clinical means. We find that 1.8 units of bilirubin in the serum is the smallest amount which causes recognizable icterus of the conjunctivæ. In the obstructive cases bile pigments are detected in the urine by ordinary routine ward tests at about the same level.<sup>1</sup> The purely hæmolytic jaundice is acholuric; we have found a bilirubinæmia of fifteen units in a case of this type with only the merest trace of bile pigments in the urine. This difference in the kidney threshold for bile is a cogent argument in favour of the chemical difference of the bilirubin in the serum in obstructive and hæmolytic cases.

It may be mentioned here that the least amount of bilirubin in the serum which will give a reaction with Fouchet's reagent, is 1.4 units. If one unit be accepted as the upper physiological limit of bilirubinæmia, there are, therefore, some cases of

<sup>1</sup> Since this was written another paper by McNee has appeared (*The British Medical Journal*, September 20, 1924, page 495) in which the statement is made that the threshold value of the kidney for bile pigment in obstructive jaundice is at least four Van den Bergh units. We cannot subscribe to this opinion, as biliruria was present in two of our cases in which the serum showed only 2.2 units.



"latent jaundice" which Fouchet's test will not reveal. It will, however, be the means of detecting the cases with a bilirubin value between 1.4 and the clinical threshold (1.8), as will be shown later.

Many cases of gall bladder inflammation and of hæmolytic jaundice fall within these limits. In detecting these and in confirming the presence of definite jaundice when the clinical evidence is inconclusive, Fouchet's test is of great value.

#### The Significance of the Prompt Direct Reaction.

The series includes twenty cases in which gross obstruction of the common bile duct or the hepatic duct was demonstrated at operation or autopsy. The accompanying table gives the details of these cases in all of which the clinical features of obstructive jaundice were present.

The prompt direct reaction was found in four cases in which it was proved that the common bile duct and hepatic duct were free from obstruction: One of acute yellow atrophy, one of cholecystitis without stones, but with much thickening of the ducts and two of hydatid cyst of the liver with gross fibroid changes in at least a portion of the organ. Blocking of some of the larger intra-hepatic ducts may well have been present in all these, but the point was not investigated. In three out of seven cases of catarrhal jaundice the prompt direct reaction was also obtained; this is perhaps accounted for by the obstruction caused by biliary thrombi in the finer ducts.

It may, therefore, be stated that jaundice due to obstruction of the common bile duct and hepatic duct always gives a prompt direct reaction. Further, in every instance in which the prompt direct reaction was obtained, the presence of obstruction at some point of the biliary tract was a reasonable assumption. We are, therefore, in accord with the statements of other investigators that the finding of a prompt reaction indicates that the jaundice is obstructive.

#### The Significance of the Delayed Direct Reaction.

The cases in which a delayed direct reaction was obtained and in which the diagnosis was verified at operation or autopsy or was clinically beyond doubt, numbered thirty-five. They fall into two groups: (i.) Jaundice from excessive blood destruction; (ii.) jaundice assumed to be due to deranged function of the liver cells in cases in which disease of the liver was present without gross obstruction of the ducts. These groups will be considered separately.

#### Jaundice from Excessive Blood Destruction.

The most important cases in the group comprising jaundice from excessive blood destruction, are those of pernicious anæmia. Nine patients have been observed, all of them gave a delayed direct reaction. In seven the pigmentation of the conjunctivæ was slight and the quantitative figures ranged from 1.7 to 3.3, averaging 2.25. In another instance we obtained the high figure of five units. The jaundice in this instance was so intense that it was regarded as probably obstructive, but, though the blood picture was not quite typical, the Van den Bergh reaction established the diagnosis of pernicious anæmia, which was subsequently proved correct by the further course. The remaining patient, examined during a prolonged remission, gave a figure of one unit. We have since found one other patient whose serum during a remission showed a normal bilirubin figure, but this appears to be exceptional; as a general rule a bilirubin value of at least 1.8 units is found even during periods of great clinical improvement.

These results may be contrasted with those obtained in two instances of grave secondary anæmia with red cell counts under two millions; in both the figure was within normal limits.

In this group also fall nine cases of hæmolytic icterus; all of the patients gave delayed direct reactions, the quantitative figures ranging from 1.5 to 15 units.

TABLE I.—JAUNDICE FROM OBSTRUCTION OF THE LARGER DUCTS.

Case Number.	Nature of Obstruction.	Type of Van'den Bergh Reaction.	Quantitative Figure.
10	Carcinoma of head of pancreas	Prompt direct	7.7
17	Carcinoma of head of pancreas	Prompt direct	7.5
48	Carcinoma of head of pancreas and of gall bladder	Prompt direct	5.8
94	Carcinoma of head of pancreas and of gall bladder	Prompt direct	7.0
107	Carcinoma of head of pancreas and of gall bladder	Prompt direct	6.0
108	Carcinoma of head of pancreas and of gall bladder	Prompt direct	5.7
108A	Carcinoma of head of pancreas and of gall bladder	Prompt direct	6.4
124	Carcinoma of head of pancreas and of gall bladder	Prompt direct	10.0
14	Stone in common bile duct	Prompt direct	4.9
31	Stone in common bile duct	Prompt direct	10.0
33	Stone in common bile duct	Prompt direct	2.6
35	Stone in common bile duct	Prompt direct	8.6
37	Stone in common bile duct	Prompt direct	2.2
39	Stone in common bile duct	Prompt direct	6.9
40	Stone in common bile duct	Prompt direct	10.3
41	Stone in common bile duct	Prompt direct	Not estimated
97	Stone in common bile duct	Prompt direct	3.7
99	Stone in hepatic duct	Prompt direct	5.7
43	Hydatid cyst of common bile duct	Prompt direct	8.7
81	Post-operative stenosis of common bile duct	Prompt direct	3.2



The Van den Bergh reaction will, therefore, be the means of detecting and identifying hæmolytic jaundice with certainty except in occasional cases of pernicious anemia during phases of good remission. We regard this as its most useful and most important function and we suggest that the diagnosis of pernicious anemia is not tenable unless the serum gives a delayed direct reaction with quantitative figures, at least during exacerbations, in excess of normal. It is clear from the figures quoted that the Fouchet test will serve for the detection of the abnormal bilirubinemia in all cases under the same conditions. These two tests are, therefore, of the greatest use in differentiating hæmolytic and non-hæmolytic anemias. But in this connexion it must be emphasized that excessive hæmolysis is a causative factor not only in Addisonian anemia but also in certain other types.

#### *Jaundice from Deranged Function of the Liver Cells.*

The patients in the group comprising jaundice from deranged function of the liver cells number seventeen and include those with cholelithiasis, cholecystitis, hepatic abscess, hydatid of liver, splenic anemia and secondary carcinoma. In all of them derangement of function of the hepatic glandular cells and absence of gross obstruction may reasonably be assumed, but these points were not established by microscopical examination. As most of the cases are dealt with under the separate diseases which they represent, they will not be discussed in detail here. Although our evidence on this point is far from conclusive, we may state that our findings in this group tend to confirm McNee's statement that the serum in jaundice of this type gives a delayed direct reaction.

#### *The Significance of the Biphasic Reaction.*

The biphasic reaction was found in fourteen cases. In seven the diagnosis was confirmed at operation or autopsy. This group comprised: One case of cholecystitis (strawberry gall bladder); three of cholelithiasis without obstruction of the larger ducts and one each of cirrhosis of the liver, splenic anemia (late stage) and secondary carcinoma of the liver. In four other cases the diagnosis was unimpeachable, but the nature of the lesions in the liver and biliary apparatus could not be ascertained. This group included: Two

cases of lobar pneumonia with jaundice and enlargement of the liver; one of jaundice in a malarial patient following two intravenous injections of "Nov-Arsenobillon" and one of jaundice with advanced heart failure.

Most of the diseases represented in this group are characterized by different types of reaction in different patients. For example, in cholecystitis and cholelithiasis the delayed direct response is found more frequently than the biphasic. This point which is discussed below, is often difficult of explanation and the interpretation of the biphasic results is undoubtedly the least satisfactory part of McNee's hypothesis.

As no microscopical studies were made we cannot adduce evidence either for or against McNee's views, but it is noteworthy that in all our patients giving the biphasic type of response, the pathological process—infective, cirrhotic or malignant—was such as would readily have given rise to the combination of obstruction of the smaller ducts and derangement of the hepatic glandular cells. To a limited extent, therefore, our results offer some confirmation of the "modern hypothesis."

#### *The Results of the Van den Bergh Test in Different Disease Processes of the Liver and Biliary Tract.*

The general diagnostic significance of the different reactions obtained with Van den Bergh's test having been outlined, it remains to discuss briefly the findings in some of the more important pathological conditions of the liver and biliary tract and to attempt to assess their value.

#### *Cholecystitis and Cholelithiasis.*

It has been already pointed out that the serum in ten instances of obstruction of the common bile duct or hepatic duct by gall stones gave a prompt direct response. These results call for no further comment. But in ten other cases of cholecystitis, with or without stones and without obstruction of the larger ducts, the interpretation of the findings offers much difficulty. The accompanying table shows the details of these cases.

The following tentative explanation of these apparently confusing results is suggested. In some cases of cholecystitis and cholelithiasis the infective lesion spreading from the ducts, so deranges the hepatic glandular cells that they are unable to

TABLE II.—THE VAN DEN BERGH REACTION IN CHOLECYSTITIS AND CHOLELITHIASIS WITHOUT OBSTRUCTION OF THE LARGER DUCTS.

Case Number.	Diagnosis.	How Established.	Type of Reaction.	Quantitative Test.
73	Cholecystitis; empyema of gall bladder, with much thickening of ducts; no stones	Operation	Prompt	2.0
98	Cholecystitis; hydatid of left lobe of liver; no stones	Operation	Prompt	3.2
14	Cholecystitis (strawberry gall bladder); no stones	Operation	Delayed	4.3
109	Cholecystitis (strawberry gall bladder); no stones	Operation	Delayed	4.0
15	Cholecystitis (strawberry gall bladder); no stones	Operation	Biphasic	3.0
32	Cholelithiasis	Operation	Delayed	1.0
34	Cholelithiasis	Operation	Delayed	1.05
38	Cholelithiasis	Operation	Delayed	1.2
25	Cholelithiasis; gall bladder much contracted	Autopsy	Biphasic	2.3
66	Cholelithiasis; gangrenous gall bladder	Operation	Biphasic	2.23

take up the normal amount of pigment; the bilirubin which, therefore, accumulates in the blood, not having traversed the hepatic cells, gives a delayed direct reaction with figures more or less in excess of normal. In others there is the local lesion of the mucous membrane and this is of sufficient intensity to cause swelling and blockage in some ducts so that an obstructive element is added and a biphasic reaction is found. When obstruction to larger ducts occurs, the prompt direct response is obtained.

As to the practical value of the results in this group we would offer the following provisional conclusions. A prompt direct reaction in the serum of a patient whose clinical features suggest a gall bladder lesion, implies stone in the common duct, but there are exceptions to this rule. A delayed direct or biphasic reaction does not exclude the presence of stones, but does exclude obstruction from a stone in the larger ducts. It is noteworthy that a bilirubin figure of one or more was found in all the cases in this group. Friedman<sup>(6)</sup> has suggested that the detection of latent jaundice is an important piece of confirmatory evidence when a lesion of the biliary tract is suspected. We are inclined to subscribe to his opinion, but our figures are too few to justify a positive statement.

#### *Cirrhosis of the Liver.*

Five instances of cirrhosis of the liver occurred in this series; in three of the patients the clinical features were pathognomonic and in the remaining two the diagnosis was verified at autopsy. Four were clinically jaundiced, two giving biphasic and two delayed direct reactions; in the fifth, though the clinical features were unmistakable, both the Van den Bergh and the levulose test gave strictly normal figures. These results might be explained on the supposition that derangement of function as evidenced by the delayed direct reaction is only apparent when considerable cellular degeneration has occurred and that with further development of fibrosis obstruction is superadded, causing the biphasic response to appear. But of this we have no direct proof. At least it may be said that the Van den Bergh reaction is of some help in excluding the presence of gross obstruction in cases in which cirrhosis is suspected.

#### *Catarrhal Jaundice.*

Our results in catarrhal jaundice have been most confusing. Of the seven cases in which the diagnosis was established by the clinical course and duration, the prompt direct reaction was found three times, the delayed direct three times and the biphasic once. Other observers have also recorded similar puzzling results. Spence<sup>(7)</sup> has shown that the levulose test has been of greater help in this type of jaundice; in every case it has revealed a serious defect of liver function and this even in the earliest stage before the jaundice has appeared.

#### *Hydatid of the Liver.*

It might be expected that the jaundice occurring with hydatid cysts of the liver would be of the obstructive type, due to compression of the larger

ducts. Our results bear this out. Of eight patients whose condition we have investigated, one manifested no jaundice chemically or clinically. Five of those with icterus gave the prompt direct response. In the remaining two the reaction was biphasic, but both were complicated by conditions which may well have given rise to hepatic cellular derangement. In one the cyst was suppurating and in the other cholelithiasis was also present. We would point out that clinical jaundice occurs in less than 50% of patients suffering from hydatid of the liver; the high percentage in our series is doubtless accounted for by the fact that recognizable icterus was the main factor in prompting the clinicians to send the serum for investigation.

#### CONCLUSIONS.

The main conclusions we have drawn from this analysis may be summarized as follows:

The Van den Bergh test is of value in detecting the presence of minor grades of jaundice in cases in which colouration of the skin and mucous membranes is absent or indefinite. By its use hæmolytic jaundice can be identified and the diagnosis between hæmolytic and non-hæmolytic anæmia positively established; this we regard as the most valuable property of Van den Bergh's test. It gives constant results in obstructive jaundice, but affords no indication as to the site or nature of the obstruction. In jaundice of other types its diagnostic value is as yet slight.

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#### DIET IN TYPHOID FEVER: A STUDY BASED UPON SEVEN HUNDRED AND SIXTY PATIENTS TREATED AT THE ROYAL PRINCE ALFRED HOSPITAL.

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New South Wales.

AN interesting alteration has been taking place during the last thirty years or so in the outlook of physicians upon the dietetic management of typhoid fever. This can be illustrated by comparing the instructions given in the first edition of Osler's

"Text-Book of Medicine" (1892) with those in the current edition. In the former the diet allowed is entirely fluid, the milk is "always diluted" and the quantity is not specified except when milk alone is given, in which case "three pints at least may be given" (that is a food value of about 1,200 calories in twenty-four hours). In the latter edition we find solid foods added (boiled eggs, milk-toast, bread and butter, mashed potatoes and the like), "milk in any form" and a definite quantity is specified, namely, food "with a value of 2,500 to 3,000 calories and containing about 70 grammes of protein." Cases of typhoid fever investigated calorimetrically have shown a production of over 2,000 calories in the twenty-four hours.<sup>(1)</sup>

To-day we find physicians divided, though not sharply, into two groups: Those who give a liberal and those who give a restricted diet. The patients with enteric fever treated at the Royal Prince Alfred Hospital during the last thirteen years can be divided very distinctly and a comparison of the two groups is of value. Conditions of treatment, other than dietetic, are practically similar. External hydrotherapy in one form or another is always used.

Let us consider the diets. In the first group the patients are allowed milk, milk foods (such as custards and junkets, *et cetera*), farinaceous foods ("Benger's Food," groats), bread and butter, eggs, fish, even fruit and meat. It is not difficult to make up the patient's caloric requirements from the above condensed list and the selection of food is regulated largely by the taste of the patient. For example, in the course of twenty-four hours there may be given 1.1 litres (two pints) of milk, 180 cubic centimetres (six ounces) of cream, 120 grammes (four ounces) of sugar (this can be easily given if the patient takes, as he should, plenty of lemon syrup as the "*Potus imperialis*" of the Royal Prince Alfred Hospital Pharmocopœia), three or four eggs (in flips, custards, boiled), 60 grammes (two ounces) of fish, 120 grammes (four ounces) of bread and 60 grammes (two ounces) of butter. This makes approximately 3,000 calories.

In the second group of patients, those with restricted diet, the great majority are given every

two hours a feed of prepared peptonized or citrated milk or whey and albumin water, each feeding varying from sixty to one hundred and fifty cubic centimetres (two to five fluid ounces). Prepared milk is given as a rule.

Let us suppose that twelve feedings of one hundred and fifty cubic centimetres (five ounces) each are given in the day. The diet will amount to 1.7 litres (three pints) of prepared milk—a value of 900 calories (one litre of prepared milk having an approximate value of 540 calories). But a feeding is often missed on account of the patient sleeping; sixty to one hundred and fifty cubic centimetres (two to five ounces) of albumin water and whey are substituted if curds appear in the motions or if diarrhoea occurs. If blood appears, however small the amount, no food at all is given by mouth for perhaps eight to twelve hours and then albumin water and whey are very cautiously resumed. Albumin water and whey are worth per litre eighty-eight and two hundred and sixty calories respectively. The food given to any particular patient in this group, therefore, amounts to much less than even nine hundred calories. This can be well seen in one case, the third fatal one of the series, in which the diet is recorded in every detail, it having been noted hour by hour as the patient was fed. This patient was in hospital for thirty days and received one hundred and sixty feedings (one hundred and fifty cubic centimetres or five ounces each) of prepared milk, seventy-seven of albumin water, twenty-eight of whey and thirteen of "Benger's Food" (the last, as prepared with milk, having a value of eight hundred calories to the litre).<sup>(2)</sup> This means an average of five hundred calories *per diem*.

Now let us consider the results obtained in these two groups, tabulated below, from the point of view of mortality and complications (hæmorrhage and perforation).

These figures may well teach us humility and remind us of the little control which we have over the course of most infective diseases; they may well bring a smile to the face of the poor harassed student perplexed as to how his clinical teacher expects him to treat this or that case of typhoid.

TABLE I.—LIBERAL DIET (2,000 TO 3,000 CALORIES).

Number of Patients.	Hæmorrhage.			Perforation.			Deaths.	
	Number.	Percentage.	Deaths.	Number.	Percentage.	Deaths.	Number.	Percentage.
165	12	7.3	4	6	3.6	5	19	11.5
153 <sup>1</sup>	—	—	—	—	—	—	12	7.6

TABLE II.—RESTRICTED DIET (500 CALORIES).

Number of Patients.	Hæmorrhage.			Perforation.			Deaths.	
	Number.	Percentage.	Deaths.	Number.	Percentage.	Deaths.	Number.	Percentage.
595	53	8.9	19	18	3	15	69	11.6
575 <sup>1</sup>	—	—	—	—	—	—	49	8.5

<sup>1</sup> Excluding patients who died within one week of admission.



They are not conclusive one way or the other, but as they stand the advantage is with liberal diet.

But we are given no uncertain bias towards generous diet by a perusal of the bedside notes. "Intensely hungry," "threatens to eat the bed-clothes," "appetite voracious" and such expressions are frequent in the notes on the poorly fed patients. The comfort of the patient is a consideration.

Then let us turn to the *post mortem* findings. The first two patients who died were treated on the five hundred calories scale for two and three months respectively. The pathologist notes in these cases "extreme emaciation," "all omental fat absorbed, omentum delicate fibrous shreds," "extremely emaciated," "pressure sores," "stomach small and contracted" and so on. Such a degree of wasting is not noted in the better-fed patients. Here we find asserting itself a great principle of nutrition which operates not only in typhoid fever, but in all diseases; not only in disease, but in the healthy man and animal, namely, if fuel in sufficient quantity for the production of body warmth and body work be not supplied in the shape of food, the deficiency can be made up only by combustion of the body tissues and the individual wastes. *A priori*, we would expect the better-nourished patient to have the better chance for life in a long fight against the *Bacillus typhosus* and its toxins and to run less risk of complications; for his tissue cells are better nourished and more able to resist the pathological changes of the disease, the local ulcerating effect in the intestines and the parenchymatous degeneration in other organs. A *post mortem* examination was not made on the body of the third patient who died and whose diet is given in detail above.

Since writing the above Dr. W. J. S. McKay has drawn my attention to figures which he quotes as having been published by Kinnicutt in the *Boston Medical Journal* of July 5, 1906. These figures represent a much larger series of cases than I have dealt with; they show a similar decrease in mortality and a greater decrease in complications under liberal diet.

#### Conclusions.

1. The old strict diet is deficient in caloric requirements.
2. It results in severe wasting in prolonged infections.
3. During convalescence the hunger becomes ravenous.
4. With a diet of adequate caloric value the extreme wasting and hunger are not seen.
5. The mortality is slightly less.
6. Complications are not more frequent.
7. The anorexia which is so common in enteric fever, must be considered a difficulty, but in spite of it the two thousand to three thousand calories mark can generally be reached. Each patient presents a separate problem and the diet best suited for each must be separately studied, the aim always being to give an adequate amount of food.

#### References.

- (1) Halliburton: "Handbook of Physiology," 1917, page 641.
- (2) Benger: "Alimentary Enzymes," 1912, page 76.

#### DYSTOCIA.

By H. A. RIDLER, M.B., Ch.M. (Sydney),  
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Street, Sydney.

THE case to be described is an example of dystocia which is occasionally seen. A typical history of such a patient is that the first two or three confinements are quite normal, then there is increasing difficulty with each succeeding confinement, labour being terminated with forceps. Then comes a difficult forceps delivery with an infant so damaged as to die soon afterwards or a still born infant; then occurs a craniotomy.

This condition is due to a lordosis gradually developing in the lumbar region, the result of the mother pushing her abdomen forward. Thus the condition becomes worse with each pregnancy. This type of woman is usually very careless about the appearance of her figure. Flexion and extension of the spine occur mainly in the lumbar region, flexion occurs in the higher part and hyper-extension in the lower (Jones and Lovett: "Orthopaedic Surgery").

I first had this condition pointed out to me at the Women's Hospital, Crown Street, by Dr. S. H. MacCulloch, when I had a patient typically affected under my care; she required Caesarean section and had a history exactly as described. Dr. MacCulloch has informed me that this condition was first described by Madame La Chapelle, who was a famous French midwife living from 1769 to 1821. Herman, in his book, "Difficult Labour," expresses great respect for her opinion. This condition is not to be confounded with the lordosis that



ILLUSTRATION OF PATIENT SHOWING LORDOSIS  
IN LUMBAR REGION OF SPINE.

occurs with a flat pelvis. The pelvis is not contracted in this type of case. The effect is to prevent the entrance of the head into the brim of the pelvis, so that the result is the same as an antero-posterior contraction.

The history of the patient whose photograph is shown, is as follows:

Mrs. A. B. had her first infant at the Royal Hospital for Women at the age of twenty years. The records show an easy labour, the second stage only lasting one hour, the infant's weight being three kilograms (six and three-quarter pounds). Two years later another infant was born, 2.2 kilograms (five pounds) in weight. The delivery was normal. Four years after this one she was confined normally of a 2.7 kilograms (six pounds) child. These three are living now. One year later with her next pregnancy, labour was terminated by a craniotomy. Three years later she had a still born infant delivered with instruments. A year after this labour was induced at four and a half months. A year later at eight months labour was induced, but delivery with forceps was difficult and resulted in a still born infant.

The patient is now thirty-four years of age and she is nearly seven months pregnant.

I am indebted to Dr. A. J. Cunningham for collecting the history of the patient and for the photographs.

#### HELIOTROPINE: THE BEST PEDICULICIDE.

By C. E. CORLETTE, M.D., Ch.M. (Sydney),  
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In the latter part of the year 1919 I received by the courtesy of Professor William Moore, of the University of Minnesota, a copy of Moore and Hirschfelder's report of the work carried out by them on the question of louse destruction.<sup>(1)</sup> This was a war-time research conducted for the American National Research Council at the University. An enormous amount of experimental work is recorded, but I pass over all this, since my intention here is to concentrate attention on one single method which emerged as a "winner" amongst the great multitude tested in practice. This was the use of heliotropine. In experiment after experiment it made a consistent 100% record of successes. There were some other substances as deadly to lice, but some of these are extremely disagreeable in odour or irritating to the skin or relatively expensive. Heliotropine has a very agreeable perfume, is not irritating to the skin and is cheap. Here is the list of chemical substances which were found to kill 100% within twelve hours: Valeric acid, phenyl iodide, creasote, naphthalene, thymol, carvacrol, eugenol, heliotropine, coumarin. They are given in the order of their boiling points. The inorganic chemicals were unsatisfactory. The results with oils were on the whole not favourable.

The experiments, it should be said, were made with particular reference to the body-louse, *Pediculus corporis*, and the substances were tested by impregnating pieces of cloth which were then pinned inside the experimenter's underwear and worn next the skin.

Referring to these tests, the authors remark:

Heliotropine was one of the best chemicals, being apparently non-toxic to the skin and lasting as long as 168 hours when used with cocoa butter, in which it was more soluble than the other fats. Without the oil, heliotropine killed just as rapidly, but having crystallized on the underwear, it was soon rubbed off by the friction encountered in wearing.

If, as far as the body-louse was concerned, there existed a quick, certain, convenient and cheap remedy, carrying an agreeable perfume, it seemed to me that it was well worth while trying on the head-louse, a pest which infests the heads of so many small children, especially after they have begun to attend school, and which calls for constant vigilance on the part of their mothers. It is also by no means uncommon in the heads of adult women admitted to or attending hospital, deny it as they may.

I therefore devised two formulæ which seemed likely to be suitable and asked the sisters in charge of children's wards and women's surgical wards at the Sydney Hospital to try them. The first preparation was a solution of heliotropine, 5%, in vaseline. The second was composed of heliotropine five parts, castor oil thirty parts and pure methylated spirit up to one hundred parts.

The solution or suspension in a viscous oily substance has the advantage that it is thereby caused to adhere to the skin and hair. Castor oil was employed in the second formula in preference to other oils because it is readily soluble (over 30%) in alcohol, which is not the case with olive oil and its congeners. In this preparation the spirit will tend gradually to evaporate and leave a solution and suspension of heliotropine in the oily residue approaching towards a concentration of 15%. By "pure methylated spirit," I mean the variety denatured with methyl alcohol, not the ordinary commercial variety denatured with pyridine, because the latter has a disagreeable smell. Outside a public hospital it would be necessary to use either the expensive rectified spirit or common methylated spirit, since real methylated spirit is not allowed to be used without special permission. On the other hand, a preparation containing spirit is more apt to catch fire than is the case with a non-volatile oil. If, therefore, a more fool-proof preparation is required, castor oil, cotton-seed oil, or even linseed oil could be used alone, though the alcohol-containing formula would probably be more favoured on every other ground.

In the hospital the vaseline preparation was found quite efficacious, but the second formula was the one favoured; the first, therefore, went out of use. The second has now been in use for five years. Beyond the fact that at the beginning I took some trouble to investigate the results by personal observation, I have not attempted to influence the course of events. But it commended itself immediately to the nursing staff and now for the whole five years it has had no rival at all. No one thinks of using anything else. It has been from every point of view a complete success, *cito, tuto et jucunde*. The children think they are getting scent put on their heads and there is no trouble.

And yet where else is heliotropine known and used for this purpose? That research report of Professors Moore and Hirschfelder seems to have aroused no particular attention. The war was over and after all their report seemed to be concerned only with the body-louse. Nevertheless, it has provided a new method of treating infestation by the head-louse which can be described without any hesitation as certainly and incomparably the best. The experimenters had to do some very disagreeable work. They deserve the thanks of mothers of school children for what they have done. Now the mothers ought to be told about it.

What is heliotropine? Heliotropine is another name for a substance known as piperonal. It is derived from safrol by oxidation with chromic acid and safrol is an important constituent of Japanese oil of camphor, a by-product in the preparation of camphor. It is, therefore, not costly to produce. Its present cost in Sydney is three shillings and sixpence per ounce. It is a colourless crystalline substance, the crystals having only a comparatively slight odour. Nevertheless, it has a perfume which when sufficiently dilute is said to be indistinguishable from the natural perfume of heliotrope, which explains its commercial name. However, in the proportions in which I have employed it, I should describe the odour as similar to vanilla. It is largely used for scenting soaps and is said to be an ingredient of many popular perfumes.

Heliotropine is readily soluble in alcohol, ether and similar solvents, very little in cold water, more readily in boiling water, very sparingly in glycerine, somewhat more in paraffin oil (kerosene), comparatively readily soluble in olive oil (about 6%). It turns yellow and brown on exposure to light. These notes are derived from standard books of reference. The solubilities given have an obvious application in pharmacy.

#### Reference.

(1) W. Moore and A. D. Hirschfelder: "An Investigation of the Louse Problem," Research Publications of the University of Minnesota, Volume VIII., Number 4, July, 1919.

#### ACHLORHYDRIA, HYPOCHLORHYDRIA AND ASTHMA.

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ALTHOUGH gastric disorders seem to play a definite part in the ætiology of asthma in some people, apparently no systematic investigation of the gastric content of these patients has been performed.

It is generally recognized that the most difficult type of asthma to treat satisfactorily occurs in patients in whom the cutaneous tests with the proteins of pollens, foods and animal dandruffs yield no reaction. Such patients usually reveal on careful clinical and X-ray examination some focus of infection, the most common site for the patho-

logical condition being in the nasal accessory sinuses and tonsils. Eradication of these septic foci by a rhinologist frequently results in the asthma being cured, but in some patients this result is not obtained and the asthma persists despite the use of the various recognized therapeutic measures. It is to this class of patient that the present preliminary communication particularly applies. Thirty such persons suffering from asthma were subjected to fractional gastric analyses, attention being directed to the determination of free hydrochloric acid, total acidity and the presence of pepsin. The usual procedure with the use of the Rehfuß tube was adopted and the indicators used were Töpfer's reagent and phenolphthalein. Peptic activity was determined by its action on fibrin, hydrochloric acid being supplied when necessary. The following table indicates the results obtained, arranged in order of increasing free hydrochloric acid:

TABLE I.

Number.	Maximum Free Hydrochloric Acid.	Maximum Total Acidity.	Pepsin.
1	0	4	Present
2	0	5	Present
3	0	6	Absent
4	0	6	Present
5	0	8	Absent
6	0	9	Present
7	0	9	Present
8	0	10	Present
9	0	10	Present
10	0	10	Present
11	0	15	Present
12	0	34	Present
13	4	13	Present
14	9	17	Present
15	9	20	Present
16	12	21	Present
17	12	21	Present
18	12	23	Present
19	15	25	Present
20	16	30	Present
21	16	32	Present
22	19	31	Present
23	24	35	Present
24	25	40	Present
25	25	44	Present
26	30	46	Present
27	30	52	Present
28	33	45	Present
29	41	55	Present
30	45	62	Present

A survey of this table shows the following interesting facts:

(i.) Twelve of the thirty patients, that is 40%, had complete absence of free hydrochloric acid.

(ii.) Twenty-two, that is 73%, had a free hydrochloric acid of less than twenty and a total acidity of less than thirty-five.

(iii.) Pepsin was present in all patients except two.

Briefly, then, achlorhydria and hypochlorhydria are common in asthmatic patients who do not react to cutaneous tests and who suffer from treated or untreated septic foci.



The administration of dilute hydrochloric acid promises to be most helpful to these patients.

Large doses—four to eight cubic centimetres (one to two drachms)—taken with meals in half a pint of water and suitably flavoured with orange juice if desired are indicated in the cases of achlorhydria. Proportionately smaller doses are indicated for use in hypochlorhydria. The proteo-clastic action of pepsin can then be efficiently exercised; for it is probable that in the absence of efficient gastric digestion, due to diminished or absent hydrochloric acid, abnormal products of protein hydrolysis, produced by bacteria, may be absorbed from the intestine and determine the onset of asthma.

The results of this simple therapeutic measure are so far most encouraging, but further time is required in these patients to see if the asthma is going to remain in abeyance. At a later date it is hoped to give further details with a report on the gastric content of pollen- and food-sensitized asthmatics.

### Reports of Cases.

#### A CASE OF TETANUS ARISING FROM AN INFECTED TOOTH.

By GEORGE BELL, M.B., Ch.M. (Sydney),  
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AND

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Honorary Physician, Sydney Hospital.

C.J.R., a boy, aged nine years, complained of toothache on September 27, 1924, and received dental treatment two days later, when slight swelling of the right side of the face was observed. The "nerve" was extracted from the tooth on October 1 and on the following day the patient was listless. On October 3 he consulted a dentist, but could not be treated as he was unable to separate his teeth sufficiently wide. On the next day his parents noticed that his lower limbs were stiff and he could not masticate his food. He also complained of pain in his back. On October 5 the stiffness of his jaw was greater and twitching of muscles was observed. By October 7 the patient would not lie down, but preferred to stand up by the bedside and rest his head on a pillow. He adopted this attitude on account of spasms of pain in his abdomen. During the previous three nights the patient had been very restless and his parents obtained little sleep. No history of any wound could be obtained. The boy was seen on October 8. The pulse rate was 120 and the

respiratory rate 28 in the minute. The temperature was 37.8° C. (100° F.). The rigidity of the muscles of the face gave him a very fixed expression, the frontalis and risorius muscles being particularly affected. His teeth were tightly clenched, but could be separated very slightly. Rigidity of the *erector spinalæ* muscle was present and there was extreme arching (opisthotonus) of the back, so much so that the boy could not lie on his back, but lay on his abdomen with his chin supported on a pillow. There was moderate rigidity of the muscles of the neck. The rigidity of the muscles of the upper limbs was not so great as that of the lower limbs which were very stiff and were held rigidly in the extended position. When rolled over in the bed the position of extension was maintained and muscular contractions occurred at irregular intervals.

Chloroform was administered by one of us (A.W.H. & C.) at 12.30 p.m. and 6,000 units of tetanus antitoxin were injected into the spinal theca after twenty cubic centimetres of clear cerebro-spinal fluid had been withdrawn. Four thousand units were also given subcutaneously. The tooth which had been causing pain and had been treated, was extracted. At 9 p.m. 36,000 units were given intravenously. The subsequent doses are noted below. Morphine was given by hypodermic injection and sulphate of magnesia was administered by the mouth.

The rigidity was still present on October 9, so chloroform was again administered and more tetanus antitoxin given. On the next day, although the rigidity and convulsions were considerable, there was no increase in the intensity of these signs.

Some difficulty was experienced in giving the intrathecal injection, so a large intravenous injection was administered on October 11. On October 12 the muscles were much less rigid: the patient could lie on his back and flex his knees. From this date the rigidity gradually diminished and he was discharged from hospital on October 25, 1924. The highest temperature recorded was 37.8° C. (100° F.) on the day of his admission into hospital. The tetanus antitoxin used was that made by the Commonwealth Serum Laboratories and with the exception of the injection given on October 14, was the concentrated serum in ampoules containing 10,000 units. Altogether 216,000 units were administered.

It would be difficult to determine the date of infection in this case. The symptoms, however, were severe and although they showed no definite abatement until October 12, there was no increase in their severity twenty-four hours after the treatment with tetanus antitoxin was commenced. Presumably the diseased tooth was the source of infection, although bacteriological proof of the presence of *Bacillus tetani* in the tooth socket was not obtained.

#### ACUTE APPENDICITIS COMPLICATED BY VOLVULUS AT THE ILEO-CAECAL JUNCTION.

By REGINALD E. NOWLAND, M.C., M.B. (Sydney),  
Wyong, New South Wales.

X.Y., aged twenty-nine years, a trained nurse, was seen by me about mid-day on October 9, 1924. She was complaining of acute generalized abdominal pain since about

TABLE SHOWING NUMBER OF UNITS OF TETANUS ANTITOXIN INJECTED.

Date.	Method of Injection.			
	Intrathecal.	Intravenous.	Intra-Muscular.	Subcutaneous.
October 8, 1924, 12.30 p.m.	6,000	—	—	4,000
October 8, 1924, 9 p.m.	—	36,000	—	—
October 9, 1924, 11 a.m.	12,000	35,000	8,000	—
October 10, 1924, 11 a.m.	—	—	—	30,000
October 11, 1924, 1 p.m.	—	70,000	—	10,000
October 14, 1924, 1 p.m.	—	—	—	5,000
Total (anti-toxin units)	18,000	141,000	8,000	49,000

3 a.m.. She said she had had three or four similar attacks in the previous few years, which had been relieved by enemata and rest in bed for a day or so.

On examination the temperature was normal, the pulse rate 96 and the respiratory rate 24 in the minute.

She was slightly distressed; the abdomen was distended especially over the right iliac fossa. Tenderness was present all over the abdomen, more so over appendiceal area. No mass was palpable. The abdomen was tympanitic.

A turpentine enema gave a good result and she was relieved.

About four hours later she still had abdominal pain, the distension was more noticeable, the abdomen was tympanitic and was especially tender and distended over the appendiceal area. Her temperature then was 37.6° C. (99.6° F.), the pulse rate was 96. I decided to operate at once. During the induction of the anaesthesia she vomited for the first time dirty foul matter and for some time after returning to bed.

I opened the abdomen by the usual split muscle method. On incising the peritoneum dark blood-stained fluid (like dirty beef-tea) gushed out; it was not offensive and was non-purulent. Darkened, distended bowel presented at the wound.

The appendix was located with difficulty; it was retro-caecal and firmly adherent, a volvulus at the ileo-caecal junction being formed with the adherent appendix as the axis. The appendix was congested and kinked, with a rounded knob on tip, about size of a small marble, to which was attached a very thick, strong adhesion. This and other adhesions were freed and the appendix was removed in the usual way. The colour of the bowel had improved much after the adhesions had been dealt with.

The abdomen was closed in layers, a drainage tube having been left in through the wound. Her general condition for the next few days was fair, although abdominal distension was very troublesome; this, however, was relieved in about forty-eight hours. The tube was removed in thirty-six hours, a lot of dirty-blood-stained fluid having escaped through it.

Subsequent course was uneventful. She resumed nursing duties about six weeks after operation and is now quite well.

The interest in this case lies in the history of the recurrent apparently mild attacks of appendicitis, the ultimate acute attack and the association with such sudden and grave peritonitic symptoms, most, no doubt, due to the volvulus.

#### A CASE OF MALIGNANT PUSTULE TREATED WITHOUT EXCISION.

By THOMAS HAMILTON, M.B., Ch.M. (Sydney),  
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New South Wales.

In view of the variance of opinion with regard to excision in the treatment of malignant pustule the following case may prove of interest.

W.S., *etatis* forty-seven, a labourer, was admitted from the Casualty Department complaining of a sore on the right side of his face. He stated that two days previously he had noticed a small pimple in front of his right ear and had cut it while shaving. He had recently bought a new shaving brush of the cheap wooden-handled variety.

The sore was four centimetres in diameter with a rather square outline. The centre consisted of a moist black slough and surrounding this was a reddish oedematous area dotted over with numerous small vesicles and pustules. The adjacent cellular tissues were inflamed and oedematous, the oedema involving the right orbit and the right side of the neck. The upper right cervical glands were enlarged and tender. Microscopical examination of the serum exuding from the vesicles revealed large rod-shaped bacilli, identical with *Bacillus anthracis*.

The general condition of the patient was good and his temperature was 37.8° C. (100° F.).

He settled the question of treatment for himself by steadfastly refusing to have the sore excised.

He was thereupon given one hundred cubic centimetres of Commonwealth anti-anthrax serum intravenously and fomentations of carbolic lotion (one in forty dilution) were applied to the sore every four hours.

On the following day he was given a further one hundred cubic centimetres of serum intravenously and two days later sixty cubic centimetres intra-muscularly. There was no reaction following administration of the serum.

On the fourth day after admission his temperature was normal and the oedema of the face had subsided.

The pustule at this stage appeared as a small black eschar 0.5 centimetre in diameter, surrounded by a margin of grey, unhealthy skin.

Normal saline solution was now substituted for the carbolic lotion and the slough separated on the tenth day.

Cultures taken from the lesion at this stage were free from *Bacillus anthracis*.

With an ordinary dry dressing twice daily the sore now rapidly healed and except for an itchy erythema of his legs which lasted two days and was probably an aftermath of the serum, the patient made an uneventful recovery, being discharged on the twenty-third day after admission.

#### Acknowledgement.

My thanks are due to Dr. W. L. Nickson for permission to publish this case.

### Reviews.

#### MEDICAL ESSAYS AND ADDRESSES.

For the past twenty years Dr. A. F. Hurst has been so prominent a figure in British medicine that any paper or address by him is sure to be of value and interest.

So when he collects his literary contributions of the past few years from the different periodicals in which they have appeared, they make a volume of great practical interest.<sup>1</sup> The views of workers in many different fields are summarized and joined in a compact whole by the experience and knowledge of the writer.

Most readers will probably turn first to the paper on pernicious anaemia or Addisonian anaemia as Dr. Hurst, a good Guy's man, prefers to call it. He would reject "pernicious" as being more likely to terrify and depress the patient than Addisonian. But patients do learn rapidly, witness the ease with which neoplasm is understood by any but the most ignorant.

The recent work on Addisonian anaemia is scattered through so many books and papers that this summing up, criticism and addition will be of great help to the busy worker, quite apart from the fact that Dr. Hurst is suggesting methods of treatment which hold out a little hope. His view of aetiology is the orthodox Hunterian of hæmolytic rather than a primary marrow degeneration as Ehrlich taught. In support he quotes the *post mortem* studies of Zadek, who found that the changes in the bone marrow were secondary to the blood changes and were only present during the active stages of hæmolytic and absent during the remissions of the disease.

The most important points put forward in early diagnosis are the absence of hydrochloric acid from the gastric juice and the invariable and permanent increase in average size of red corpuscles. This last is best shown by the valuable graphic method of Price-Jones in which the numbers of corpuscles of different diameters are plotted vertically and their diameters horizontally. In normal blood films the peak of the curve is at 7  $\mu$  and the base is

<sup>1</sup> "Essays and Addresses on Digestive and Nervous Diseases and on Addison's Anemia and Asthma," by Arthur F. Hurst, M.A., M.D. (Oxon.), F.R.C.P.; 1924. London: William Heinemann (Medical Books), Limited; Demy 8vo., pp. vii. + 306. Price: 21s. net.

comparatively narrow between  $6\ \mu$  and  $8.5\ \mu$ . In Addisonian anemia, on the other hand, the whole curve is shifted to the right, so that the peak is between  $8\ \mu$  and  $9\ \mu$  and the base lies between  $6\ \mu$  and  $10\ \mu$ . Such curves will undoubtedly be very tedious to construct in every case, but Dr. Hurst gives example after example of their diagnostic value.

Another valuable test discussed is that of Van den Bergh for the presence of bile pigment in the blood. When this is due to biliary blockage, gall stones, for example, the "direct" reaction is obtained, when due to blood destruction, the "indirect." It is the last which is found in Addisonian anemia, it is the *intra vitam* equivalent of the iron test *post mortem*.

Dr. Hurst has, as one may expect, much to say of achlorhydria; all of it is stimulating and much of it new. He quotes widely from his own and others' experience to show the constancy of the relation, how the achlorhydria is present constantly before the anemia appears and how in familial cases the achlorhydria has the same distribution as the anemia. Curves of fractional test meals illustrate every point.

Subacute combined degeneration of the cord is shown by a complete series of tests to be only one leg of the tripod of which pernicious anemia (or megalocytosis, as shown by Price-Jones curves) and achlorhydria are the other two.

In regard to actual causation the frequent occurrence of *Streptococcus longus* in duodenal cultures, suggests a relation more than accidental, but so far no other of Koch's postulates have been fulfilled.

There is an excellent review of treatment, but at the end we are left not very hopeful; hydrochloric acid, vaccines, removal of septic foci, milk (soured or otherwise), splenectomy, arsenic and blood transfusion are all considered. None is specific, all should be used in conjunction and may produce great benefit. That the disease may often show remarkable remissions with or without any treatment, is not nearly sufficiently emphasized.

The papers on digestive disturbances reach a very high level and make the reader wish that Dr. Hurst would write a small volume on the medical aspect of dyspepsia. The subjects he discusses are nervous disorders of the stomach (with a paragraph on the vomiting of pregnancy), gastric diathesis (mainly ulcers and their causation), achalasia of the oesophagus (cardio-spasm) and of the rectum (Hirschsprung's disease), "The Sins and Sorrows of the Colon" (a lecture most appropriately delivered at Harrogate), ulcerative colitis, chronic appendicitis and gall stones. They are discussed with a lucidity and simplicity that make them easy to read and easy to remember. Compare the article on achalasia of the oesophagus (cardio-spasm) with other accounts of the same condition. Compare too the simplicity of examination and treatment recommended, all except a simple X-ray examination being methods any practitioner could carry out for himself.

But perhaps the best chapter is that on asthma. Hurst, himself an asthmatic, joins the band of physicians who have examined and described their own diseases, as for example, Mackenzie, on migraine in Clifford Allbutt's "System." There is no rigid classification and but little dogmatism. A rough classification suggests as causes: (i.) Protein sensitiveness either external in the form of pollen, hairs, feathers and so forth or internal as in bacterial toxins; (ii.) hysteria and emotion; (iii.) endocrine gland disturbance. He shows how all these are intertwined and that the essential feature common to all of them is a hyper-excitable centre in the medulla controlling bronchial spasm. Hence the essential part of all treatment (just as in epilepsy) is to allow this excitability to subside by diminishing the number of attacks. None of the various measures which we find successful, act directly; they all act indirectly by protecting the delicate centre from exciting shocks of whatever nature.

Hurst discusses all the normal measures and especially the newer work on protein sensitiveness, but he regards 57% as the upper limit of cure to be expected in this respect. It would be very interesting to hear his views and his experience of the particularly stubborn form

of asthma met with in the post-gas fibrosis conditions in ex-soldiers.

Adrenalin, of course, he appreciates very fully and with his own personal experience to back him insists on early administration as soon as the attack threatens.

Of the use of intravenous peptones he has nothing to say, confirming by his silence the poor results many others have obtained.

The two final chapters are perhaps the most interesting and the most disappointing in the book. They deal with hysteria in organic nervous disease and with hysterical contractures. Hurst's evolution as a psycho-therapist has been interesting to watch. In 1916 he was a hypnotist, as were many others. It was so easy and the results were so miraculous, if the patient were not seen again after a little time. It was just like giving morphine to a patient with acute appendicitis. The symptoms clear up amazingly and the attack may pass off. But it may not.

A little later at Seale Hayne Hospital Hurst had given up hypnotism and was using the explanatory and reasoning methods of Déjerine. At the same time he and his fellows there were making exceedingly useful studies in the signs and symptoms of hysteria and were showing that many of them, for example the spiral visual fields, were due to unconscious suggestion on the part of the examiners.

Dr. Hurst has a remarkable power of commanding the patient's confidence, a power of tremendous value in the treatment of functional nervous disease. To this power he probably owes much of his success.

It would be interesting to know how many of the Seale Hayne patients (like many hypnotized patients) have since relapsed under the economic stress of life in Great Britain to-day. There is no hint anywhere in these articles that the symptoms are due to an underlying nervous condition in the patient which is most urgently in need of treatment. This condition may be simple—fear of pain, desire for a pension, for accident insurance or genuine belief in the extent of the disability, the result of auto- or hetero-suggestion. These cases can no doubt be dealt with as simply as Dr. Hurst suggests. But (as some of his old colleagues at Seale Hayne have since learned) there is another and larger class in whom the removal of hysterical symptoms, be it never so dramatic, is not a cure.

Unless the patient's inward mental balance be restored, either by the physician or by some other circumstance, fresh symptoms will arise and the work will all have to be done again. To discuss the matter fully would be to go over the whole humiliating and pitiful chapter of the war (or worse still, post-war) neuroses—the cocksureness of ignorant authority and the bitter squabble between the organic and the psychogenic schools.

Dr. Hurst, perhaps, feels that he is writing for the general physician and surgeon (and obstetrician) and not for specialists, but the parallel of appendicitis is a very close one. Should we believe that we had done our duty to such a patient by carrying him through an acute attack and troubling no further about the actual basic condition, the diseased and probably dormant appendix? It is to be admitted that the treatment and cure of functional nervous disease is more difficult and uncertain than that of appendicitis. "As curable as cancer," said Janet. Still functional nervous diseases are to-day crying out more for treatment than almost any other human ill and it is not fair to discuss them as Dr. Hurst does in so light a way with an "anybody-can-do-it" kind of air.

This is perhaps the one weak spot in a book which is full of good things, which is as easy to read as a novel and which should be in the shelves of every practising physician and surgeon.

#### AMBROISE PARÉ.

In a previous volume of the "Classics of Medicine" the beginnings of the modern development of surgery were set out in the works of John of Ardenne, a master of mediæval surgery. One can picture this gaily-dressed



cleric member of the aristocratic masters of surgery teaching his students the art of the cautery and of cupping, the details of wound surgery together with his own new method of radical operation for fistula, often, too, interlarding his remarks with quotations from the Arabian writers and commentators on medicine and surgery.

At that time men only saw the Greek ideals "as through a glass darkly," but world events were in the fifteenth century at last to bring them face to face with the knowledge and above all the scientific method of Hellenic culture.

Experiment not argument, facts not authorities were from now on to purify more and more the accumulated mass of folk medicine and surgery, magic and superstition which formed the main stock-in-trade of our Saxon forefathers.

The great plague of 1346 engineered by that deadly trinity of evil, the rat, the flea and the *Bacillus pestis*, swept from Europe at least half its population and left its social framework in a battered state. Feudalism never quite recovered from the shock and was finally blown out of existence by the invention of gunpowder and with it much of the monastic domination in the mediæval period also disappeared. Already about 1321 the Council of Tours had dealt a fatal blow to the cleric as surgeon, forbidding to the monk who after all was the learned man of the times, the letting of blood. Surgery then during the fourteenth and fifteenth centuries led a chequered existence. A very few masters of surgery, hidebound by tradition, still remained; while the main surgery of the day was carried out by the barber surgeons, who were somewhat jacks of all trades, equally ready to shave off a beard, excise a hernia, cut for the stone or give an enema. Surgery indeed was in a sad state of obloquy from which the status at the wars of the wound-surgeon only partly redeemed it. Beside these more or less trained and expert practitioners, there existed a long and varied series of itinerant "specialists" who, following some family "secret," couched cataracts or removed hernial sac (and testicle!). Wound surgery itself followed fierce methods; boiling oil was the staple dressing for gun-shot wounds; healing by second intention considered normal; the cautery relied on for hæmorrhage in amputations.

Just when surgery seemed almost at its lowest ebb the middle of the fifteenth century heralded the appearance of the Renaissance. The fall of Constantinople (1453) set free once more for the welfare of humanity the real Hellenic culture. The recent discovery of printing broadcast knowledge as never before. The new knowledge as for example through Linacre at Oxford, captured the universities. With this re-birth men seemed to cast aside the trammels of tradition and authority and to feel and think and see for themselves.

Early in the sixteenth century three great pathfinders in medicine, anatomy and surgery lead the advancing tide of knowledge. Paracelsus burnt publicly the ancient tomes, the medical text-books of the past thousand years. Vesalius dissected the human body for himself and dared, not without violent opposition and personal persecution to controvert the accepted anatomy of Galen. Paré freely utilized the work of Vesalius, the first modern work on anatomy, in his own publications and permanently raised the status of the science and art of surgery till it was well on its way towards its high modern level.<sup>1</sup>

When at the age of twenty-seven he began professional life as an army surgeon, Paré, like Hippocrates, went to nature for his training, abandoned the boiling oil method, preferred the ligation of vessels to the use of the cautery in amputations and generally used his own common sense. He became both successful and popular and soon rose into royal favour. It is amusing to read that nothing annoyed the Faculty of Medicine of the time more than his intrusion as a mere surgeon into theory

and especially among other statements his criticism of the belief in maternal impressions on the fetus and later his scornful denial of the virtues of "mummy" as medicine and of the value of the horn of the unicorn as an antidote against poison.

It is significant that at this very period the full legal status of our own English company of barber surgeons was confirmed by Henry VIII. (1512) and they were then exempted from the duty of bearing arms and of serving at inquests. In 1540 by act of Parliament, the surgeons who practised as barber surgeons, were consolidated with or merged into the Guild of Surgery under Thomas Vicary, master of the barber surgeons, surgeon to St. Bartholomew's Hospital and Sergeant-Surgeon to the King. The well-known picture by Holbein, as stated on the inscription, represents this *Societas Chirurgorum* kneeling before Henry VIII.

Like so many great leaders in the profession, Paré was a man with great sympathies and high personal and moral courage. He was not afraid as a young man, though threatened with the galleys, to refuse to serve the Duc de Guise, then the enemy of France. He strove to protect his fellow practitioners and obtain for them pensions when because of attendance on plague patients, their practice had been ruined. He took an unusual interest in the epidemics of his times, plague, small-pox and scarlet fever, and advocated the appointment of medical officers of health. In spite of professional jealousy he freely acknowledged the value of other men's work and valued their cooperation. He took a high place in royal circles for years and is said to have been the only Huguenot who survived in Paris after St. Bartholomew's day. Although his writings appear somewhat egotistical because of their anecdotal style, the sturdy and true humanity of this great surgeon is excellently shown by his own favourite comment on his cases, *Je le pansay et Dieu le guarist*—I dressed him and God healed him, and the motto below his portrait, *Labor improbus omnia vincit*. Dr. Charles Singer's editorship of this series guarantees the historical value of the excellent short biography by Dorothea Waley Singer, while the substantial selections from Paré's books give us a realistic glimpse of the man and his work.

#### AN ENCYCLOPÆDIA OF MEDICINE.

THE twelfth volume of the "Encyclopædia Medica" includes titles from "Skin" to "Tuberculosis" and covers many interesting subjects.<sup>1</sup> The skin is dealt with in a number of special articles by various writers, occupying seventy-seven pages. Illustrating the skin articles are three beautifully executed coloured plates, one depicting *adenoma sebaceum*, another depicting *lupus vulgaris* and the third depicting *tinea barbae*. The article on small-pox occupies twenty-two pages and is illustrated by six photographs of patients suffering from the disease, but the blocks have not been very well printed. The spinal cord is given twenty-three pages and surgical affections of the spine thirty pages. Diseases of the stomach and duodenum occupy sixty-two pages, suppuration twenty-five, syphilis forty-two, thyroid gland thirty-one, tongue twenty-one, tonsil twenty, toxicology forty-seven, dangerous trades twenty-four and tuberculosis fifty-eight pages. There are illustrated plates in connexion with several of the articles, as well as half tone illustrations in the text, but the only coloured plates are those used in illustrating skin diseases.

The volume represents a vast amount of work on the part of its various contributors and it is evident that great care has been taken to keep the articles, as far as may be, up to date.

<sup>1</sup> "Selections from the Work of Ambroise Paré, with Short Biography and Explanatory and Bibliographical Notes," by Dorothea Waley Singer; 1924. London: John Bale, Sons and Danielsson, Limited; Crown 8vo., pp. 246, illustrated. Price: 12s. 6d. net.

<sup>1</sup> "Encyclopædia Medica," under the General Editorship of the late J. W. Ballantyne, M.D., C.M., F.R.C.P.E. (Volumes I. to VIII.), and Alexander Goodall, M.D., F.R.C.P.E. (Volumes IX. to XI.); Second Edition. Volume XII: "Skin" to "Tuberculosis"; 1924. Edinburgh: W. Green and Son, Limited. Sydney: Butterworth and Company (Australia), Limited. Royal 8vo., pp. 769.

## The Medical Journal of Australia

SATURDAY, FEBRUARY 21, 1925.

### The Control of Surgeons.

THE BRITISH MEDICAL ASSOCIATION exists for the advancement of medical science, for the improvement of medical practice and for the maintenance of the honour and interests of the medical profession. It would seem, therefore, that the duty of keeping the standard of surgical practice up to a reasonably high level would be a charge of the Association.

During the past few years a movement has been started in Australia having for its object the raising and maintaining of the standard of surgical practice. The attention of the members of the medical profession has been directed to the constitution of the American College of Surgeons and quite recently invitations have been addressed to the profession in Australia by this college to induce recognized surgeons to be given the advantage of membership. Australian surgeons entertain feelings of good will and friendship towards their American colleagues, but the majority realize that it would be invidious were a foreign organization allowed to gain any sort of control over the conditions of practice in Australia. The American College of Surgeons has introduced an admirable set of regulations for the standardization of hospitals and it also endeavours to give a guarantee to the public of the competence of its members as surgeons. Hospital standardization is admirable in proportion to the strictness with which the authority exercises its penal powers. Among other things, it requires every surgeon holding a hospital appointment to make returns of his hospital practice and to be prepared to give an explanation if his pre-operative diagnoses are unusually inaccurate or his results less good than a reasonable standard. If a surgeon fails repeatedly in either direction, he may be asked to resign his appointment. If these rules were enforced without fear or favour, the

result would without doubt be an improvement in the general standard of surgical practice. But we venture to suggest that it would necessitate an extraordinary amount of determination and pluck on the part of the authority to carry these rules into effect.

The question has been asked why the British Medical Association does not undertake the task of regulating the practice of surgery. The Association would be competent to initiate a system of hospital standardization, but it is doubtful whether the hospitals would agree to subject themselves to the control of a voluntary organization. Again, it would have to be considered whether a non-statutory body could exercise the disciplinary authority over the members of the staffs. Without this restraint this part of hospital standardization would be useless except in theory. On the other hand, the British Medical Association could not confer degrees or other distinctions on practitioners who have manifested their competence as surgeons. If a statutory body were created for the purpose of granting such distinctions, it does not follow that every surgeon would desire to obtain them. If the public were educated to differentiate between the practitioner capable of performing the many duties involved in general practice and the highly trained surgeon whose competence to perform major operations is recognized, it would be a hazardous matter to refuse to grant the necessary distinctions to an applicant of doubtful ability. It is certain that a voluntary organization would have to be endowed with unlimited wealth to meet claims at law for damages for loss of practice resulting from such a refusal. While it is eminently desirable that the public should be protected against the inexperienced practitioner who "does his own surgery" in the suburbs and cities without much experience and special training, the practitioner in the country has no choice in many instances. He must have recourse to operative treatment in emergency or deprive his patients of the advantages of effective treatment. However advisable it might be to introduce a hall mark of the kind indicated of the expert surgeon, this plan is impracticable on account of the exigencies of Australian practice and on account of

the dangers to those who might endeavour to institute it. We fear that in the future as in the past the public must be warned that if they wish safety in surgical treatment, they should entrust themselves to practitioners who have been chosen to occupy the positions of honorary surgeons to the great public hospitals. The mere possession of a degree or qualification in surgery is not in itself a sufficient guarantee.

### Current Comment.

#### THE CHORIOID PLEXUS.

ALTHOUGH Willis in 1664 drew attention to the glandular nature of the granulations in the cytoplasm of the cells of the chorioid plexus, it was not until 1854 that the work of Favier caused the general recognition of the part played by the chorioid plexus in the formation of the cerebro-spinal fluid. Luschka investigated the question from the histo-pathological standpoint and confirmed what had been claimed in regard to the glandular nature of the structure. In addition to the secretory function there has been attributed to the chorioid plexus a resorptive function together with the production of an internal secretion. Loeper and Pellizzi have suggested that products of disintegration of the central nervous system, such as lipoids, are reabsorbed by the epithelium of the plexus. Fleischmann expressed the opinion that these organs have an antitoxic rôle to play in regard to certain harmful products which are filtered and absorbed by the plexiform structure. Pettit and Girard have thought that the cells of the chorioid plexus which have the appearance of cells found in glands producing internal secretion, act as internal secretory glands. Von Monokow has elaborated this idea and has claimed for the chorioid plexus bio-chemical activities associated with the development and function of the central nervous system.

Dr. Loyal E. Davis has recently made an interesting study of the chorioid plexus.<sup>1</sup> In the opening part of his paper Dr. Davis refers to many studies which have been made in regard to the chorioid plexus. He points out that three different views have been held in regard to the nature of the granules in the cells. One group of investigators regarded the granules as being nothing else than mitochondria. Among these were Hworostuchin and Ciaccio and Scaglione. The latter two workers stated that normally the perinuclear portion of the cytoplasm consisted of a granular, filamentous structure in which could be seen small, colourless vacuoles. The peripheral cytoplasm was either homogeneous or contained fine granules. They concluded that the protoplasmic granules were mito-

chondria. Hyaline droplets which were seen in the basal portion of the cells, were in their opinion collections of a fatty substance consisting of a cerebroside or a phosphatide and the vacuoles were the result of *post mortem* or osmotic changes. Saito believed that the granules were mitochondria and were the result of intra-cellular metabolism.

In regard to those who have held that the granular bodies were evidence of secretory function, he refers to the views of Schlapfer, who thought that granules or *Globoplasten*, apparently derived from the nucleus, were the initial forms of secretory droplets. He stated that these secretory droplets contained a glycoproteid substance which contributed to the alkalinity of the cerebro-spinal fluid. He described other droplets as consisting mainly of fatty acids and lipoids. The third group of workers referred to by Dr. Davis are those who believe that the granules in the cytoplasm constitute definite evidence of the absorptive and resorptive function of the plexus cells.

Dr. Davis examined the chorioid plexuses from four different groups of brains. In brains affected by intra-cranial tumours with normal cerebral ventricles, the cytoplasm of the epithelial cells of the villi was finely granular, but packed with large, coarse, round granules which seemed to extrude from the cells. These granules did not become stained by ethyl violet-orange G which very easily stains the zymogen cells of the pancreas. In the plexuses from brains affected by obstructive hydrocephalus the cells were packed with granules. These granules were easily stained by the "usual mitochondrial methods," but could not be demonstrated by ethyl orange-violet G. In brains affected by so-called "essential" hydrocephalus the cell granules were much less numerous. Frequently they were absent and in these cases the cells had a honey-combed appearance. These findings were ascribed to *post mortem* changes. In one instance the brain was affected by non-obstructive hydrocephalus and the chorioid plexus was enormously hypertrophied. The cells contained many granules which exhibited the same staining characteristics as those in the first two groups.

In discussing his observations, Dr. Davis says that the most interesting finding in these plexuses was the presence of round, darkly staining granules. He states that the histological evidence that the cells secrete cerebro-spinal fluid has been both meagre and disputable. If the granules actually have a secretory function and are comparable to the zymogen granules of the pancreas, they should stain readily with ethyl violet-orange G. This is not the case, however, for they show an affinity for the usual mitochondrial stains. They stain more readily than mitochondria. They are destroyed by fixation methods which usually destroy mitochondria. Dr. Davis maintains that if these granules represent a secretory function, it would be absolutely essential in addition to demonstrate mitochondria within the cells. He has found no other structures within the cell protoplasm which might possibly represent mitochondria. He holds that if a secretory rôle is assigned to the granules,

<sup>1</sup> *The Journal of Medical Research*, September, 1924.



it would be expected that increase in intra-cranial pressure would have some influence on their arrangement, size or staining reactions. He has not found any variation under these circumstances. He concludes that these granules are of a mitochondrial nature and are not evidence of the secretory nature of the cells. He adds that although there is no histological evidence that the chorioid plexus secretes cerebro-spinal fluid, other investigations have made it quite clear that this structure is intimately concerned in the production of this fluid. He regards it as logical to assume that the relation of the chorioid plexus to the production of cerebro-spinal fluid is analogous to the present accepted relation of the kidneys to the production of urine.

Dr. Davis's observations on the staining reactions of the cells are important and his suggested analogy of the plexus to the kidneys is interesting. The analogy may or may not be correct, but it is doubtful whether it can be complete. If obstruction occurs to a ureter of one kidney, there is an immediate increase of pressure in the pelvis of the affected kidney. Ultimately the cells of the kidney become destroyed and the whole organ is reduced to a mere shell. In the presence of chronic hydrocephalus there is a great increase of intra-cranial pressure and on Dr. Davis's own showing there is no alteration in the character of the cells of the plexus. His case of hypertrophy of the plexus, moreover, is evidence in this direction. Whether the hypertrophy of the plexus in his case was the cause of the hydrocephalus or not is immaterial. There was an increase in intra-cranial tension accompanied by hypertrophy.

#### SICKLE CELL ANÆMIA.

DURING the last few years attention has been drawn in America to a condition which is characterized by severe anæmia and the occurrence of sickle-shaped and elongated erythrocytes in the blood. This condition is known as sickle cell anæmia. The first case was described by Herrick in 1910 and others were subsequently reported by Washburn, Cook and Myer and Mason. Sydenstricker, Mulherin and Houseal in 1923 reported two cases occurring in children and made some most interesting observations in connexion with them. All cases reported so far have occurred in negroes. Evidence of severe anæmia has invariably and chronic ulcers of the leg have frequently been present. A green or yellow tinge of the sclerotic has always been noted. Splenic enlargement has not been present except in one instance reported by Sydenstricker, Mulherin and Houseal and in this the patient had had a severe malarial infection seven months previously. It is important to note that sickle-like appearance of erythrocytes has been noted in the blood of persons who are apparently healthy. Sometimes "sickling" in the blood is accompanied by symptoms of a very mild nature and sometimes exacerbations occur during which the patient is more or less completely incapacitated. A feature which has been constantly noted is the "sickling" of the

red cell *in vitro*. The deformity is a progressive one and is found when a smear preparation of blood is made on a cover glass. It is not as prominent in a free hanging drop of blood as in the preparation spread on a cover glass. The "sickling" does not occur in every specimen of blood obtained from a patient, remissions may be responsible for this and the method of preparation of the film has been held to account for the absence of the phenomenon. In addition to the sickle-like deformity of the erythrocytes, Emmel found large mono-nuclear leucocytes and transitional cells which had ingested erythrocytes. Sydenstricker found the same phagocytic phenomenon, but its occurrence is apparently not constant, for other observers have failed to find it. Sydenstricker, Mulherin and Houseal after finding phagocytosis in fresh specimens of blood, endeavoured to produce phagocytosis of normal erythrocytes by the leucocytes of affected persons, but without success. Washed leucocytes from patients, together with their serum, were mixed with washed erythrocytes from the compatible blood of a normal individual and no phagocytosis occurred. Washed normal leucocytes from compatible blood were mixed with the erythrocytes of patients in their own and normal serum and no erythrocytes were ingested.

Most of those who have reported cases of this peculiar condition, have suggested various underlying causes. Dr. George S. Graham in a recent report of a case with *post mortem* findings, suggests that the condition should be considered as a "*status hæmicus*" analogous to the well-known *status lymphaticus*.<sup>1</sup> In this manner he explains the "latent sickling" of erythrocytes in the blood of persons who are suffering from no other signs of the disease. He thinks that the immediate causative factor operating with this "status" is probably bacterial and most likely the streptococcus. Cook and Myer thought that the phenomenon was in part at least due to an accentuated or abnormal activity of the same factors which in normal hæmatogenesis are involved in the transformation of the original spherical erythrocyte into a biconcave, disc-shaped form. Huck concluded that the "sickling" of the red cells was due to something inherent within the cells, not to any substance in the serum. He thought that it was possibly a surface tension phenomenon not occurring in the circulating blood to any great degree. Dr. Graham thought that the paucity of deformed cells in a hanging drop preparation suggested that deformation was a physical change dependent on a peculiar lability of the red cell. Like Sydenstricker, Mulherin and Houseal, Dr. Graham found lesions of the hæmatopoietic system in the *post mortem* examination made by him.

The reports of sickle cell anæmia are still incomplete. It would appear that those who have investigated it, are justified in describing it as a definite disease entity of a familial nature affecting those of the negro race. Further researches, possibly of a bio-chemical nature, on the blood of patients may throw light on the nature of the condition.

<sup>1</sup> Archives of Internal Medicine, December 15, 1924.

## Abstracts from Current Medical Literature.

### SURGERY.

#### Reconstructive Surgery of the Hand.

STERLING BUNNELL (*Surgery, Gynecology and Obstetrics*, September, 1924) deals with the principles and technique he has found useful in the reconstructive surgery of the hand after industrial accidents. He points out that if the worker is a manual labourer, his earning power is seriously impaired when his most valuable member is crippled. The usual surgical procedures are too rough and what Bunnell calls atraumatic technique is essential. As main principles, the wrist and fingers must first be put into functioning positions, that is the wrist should be in extension and the fingers partially flexed, especially in their proximal joints. The thumb should oppose the fingers. A hand with a straight wrist, with extended proximal finger joints and with the thumb at the side of the hand, is practically useless. During healing these positions must be maintained. Joints must be mobilized before tendons are repaired or no motion will result. In all dissections of the hand it is essential to avoid the trauma of sponging and to operate under the ischaemia of a tourniquet. Too long an ischaemia will result in a degree of firm induration of the parts. An hour is safe; two hours gives some reaction. The pneumatic blood pressure band is the best. For most reconstruction special splints must be used; the surgeon must adapt them to each patient. They are usually made of metal. Records of the original condition and progress of the case by photographs, measurements and careful notes are most important for future reference. In the mobilization of stiff fingers he asserts that a great deal can be achieved by consistent, steady traction in just the same way that dentists draw misplaced teeth into line. Burns, infections or extensive injuries often leave contracting keloid scars which draw joints into extreme malpositions. For these radium and X-ray have proved unsatisfactory, but good results are obtained by complete excision of all the scar tissue, followed by tubular pedicle skin grafting. Thiersch grafting and simple excision and undercutting of the wound may be advisable in some cases. In all contractures in the palm it is best to remove the palmar fascia. The Dupuytren's contracture can readily be corrected by the above method. Keloid formation is racial, but is also largely due to tension. The medial, longitudinal incision is the one most to be avoided in the wrist, palm or fingers, as it leads to flexion contracture. In the finger lateral or cross incisions do less harm, in the palm L-shaped ones are preferable and at the wrist transverse incisions are the best. Care should be taken not to injure nerves. Severing the median

nerve practically wrecks the hand. If opposition of the thumb cannot be obtained by nerve suture or if the thenar muscles are destroyed, function can be regained by a tendon transference operation, the details of which he gives. Bunnell deals with a few other conditions, presents a very great number of illustrative plates and gives full technical details of his procedures.

#### Peri-Arterial Sympathectomy.

JEAN JIANO (*Revue de Chirurgie*, No. 7, 1924) writes that the operation of peri-arterial sympathectomy in practical surgery every day acquires fresh indications. According to Leriche, the efficiency of this therapeutic procedure lies in the suppression of pathological reflexes and trophic mechanisms with vaso-dilator peripheral impulses which may act singly or together. There is a great variety of indications given, including prominently causalgia, chronic ulcers and varicose ulcers of the leg, Raynaud's disease, delayed healing of ulcerated and painful, oedematous or cyanosed amputation stumps, trophic ulceration, *pruritus vulvae*, vulvar kraurosis, nervous gastropathies, gastric ulcer and some forms of gangrene. Jiano demonstrates in a series of case records that in every one of these pathological states the operation is demonstrably efficacious, more especially in the type in which the pathogenic factor is a trophic trouble. In the others the results are variable or transitory and in a few absent. He realizes that the sympathetic nerves regenerate with great rapidity, so does not guarantee the permanency of the results.

#### Gall Bladder Surgery.

WALTER MARTIN (*Annals of Surgery*, March, 1924), discussing recent controversial questions in gall bladder surgery puts forward the following queries for settlement: Is it true that removal of the gall bladder is not accompanied by any untoward after results? Is chronic appendicitis followed by hepatitis and hepatitis by cholecystitis? Do gall stones ever lie latent or do they always cause symptoms? Is it justifiable to remove a slightly infected gall bladder in order to forestall years of possible suffering. After studying a series of two hundred and twenty-nine cases in which cholecystectomy had been carried out and three hundred and twenty-one "follow-up reports" on patients with various operations on the biliary tract and several autopsy reports, he comes to the following conclusions: There have been no reports of serious interferences with function or loss of nutrition following removal of the gall bladder. There are occasional reports of damage done to the common duct during single cholecystectomy, even by operators of large experience. Both cholecystectomy and cholecystostomy cause adhesions and so sometimes interfere with the function of the liver and duodenum. The proof that the gall bladder should be removed for very slight lesions of the wall, ac-

companied by symptoms of indigestion, is not yet sufficiently established. It cannot be proved that slight degrees of cholecystitis do not resolve. The prophylactic removal of a normal gall bladder does not seem justified; nor is the proof convincing that inflammation of the gall bladder wall is spread from the live substance through the lymphatics. It is not yet established that bacteria from an obliterated appendix enter the portal circulation in sufficient numbers to cause hepatitis and cholecystitis. Cholelithiasis must be considered an important factor in determining the initial lodgement, the persistence and transference of the infection in a large percentage of cases of cholecystitis. Both clinical experience and autopsy records establish the slow rate of progress of lesions of the gall bladder. Cholecystectomy for gall stones and definite lesions of the gall bladder wall, unaccompanied by lesions of the common duct, gives excellent results and a low mortality rate. There is very little clinical or autopsy evidence of the association of persistent hepatitis, cirrhosis and pancreatitis when the disease is confined to the gall bladder wall. Common duct stones, choledochitis and cholangitis are late lesions and have a high mortality. Patients should come to operation before these lesions are present.

#### Dural and Brain Defects.

ALBERT E. HOLSTEAD AND HAROLD D. CAYLOR (*The Journal of the American Medical Association*, April 26, 1924) give a comprehensive review of the literature on the subject of repair of dural and brain defects by different transplants. In a short résumé of the different methods tried and often times abandoned, they mention Klein Schmidt who thinks that blood vessel wall should be, anatomically, the best transplant, but that it is obviously impossible owing to the small quantity available. Among other substances tried and advocated at different times were skin, periosteum, quantum fat, foreign bodies, osteo-periosteal grafts, fascia and many combinations of these. Bode employed fat and fascia, but abandoned them owing to adhesions forming between transplant and brain. He then tried skin and fat with the skin surface turned next to the brain, but this stretched and there is difficulty in sterilizing the skin. Peritoneum has been most used by Kolazek, who concludes that it will always form adhesions to the brain and in some instances is totally absorbed. Homoplastic grafts of peritoneum are more uncertain as to life and always form firm adhesions. Morris used omentum, but reported no end results. Autoplastic fat used by Rehn and Smiruoff gave many good results, but occasional adhesions. Rehn advises fascia and Smiruoff discourages the use of fat alone. Finster used foreign bodies, such as celluloid, in large defects. Skillern reports success from combined fat fascia and bone graft taken from the tibia. Kerr used osteo-

periosteal transplants taken from adjacent healthy skull under local anaesthesia with excellent results. The greatest number of operators now use autoplasmic fascia in dural repairs. Almost all report good results and agree that this is the most desirable substance for the work. The graft must always be one third larger than the defect and need not be stitched in place. Fascia is strongly viable and is not easily infected, is anatomically similar to dura and is always available and easily secured. The authors give several histories of cases in which they used fat fascia with excellent results.

#### Angina of the Coronary Artery.

R. KAUFMANN (*Wiener Medizinische Wochenschrift*, November 1, 1924) relates the history of a male, aged sixty-two, who complained of severe angina. As medicinal measures were ineffectual, the vagus was resected in the neck. Four centimetres of the cervical sympathetic were removed above the stellate ganglion and the adventitious coat of the common carotid below the bifurcation was removed for three centimetres. After eight weeks pains recurred and the patient had to give up work. In addition, pronounced Cheyne Stokes type of breathing was present. Hydrothorax and general oedema with hepatic enlargement were next noted. At the autopsy definite sclerosis of the left coronary artery with an old thrombosis and a fresh embolus superadded were observed. The history shows that the trouble lay in the coronary artery and not, as supposed prior to the operation, in the aorta.

#### Resection of Cervical Sympathetic for Bronchial Asthma.

A. VON GENERSICH (*Klinische Wochenschrift*, October 28, 1924) gives an account of a patient successfully operated upon for severe asthma. The patient, a male, aged sixty-four, had suffered from childhood. Medical treatment including X-ray was useless and his general emaciated, enfeebled condition merited active surgical measures. Under local anaesthesia the left lower cervical ganglia were extirpated. Microscopical examination revealed poor staining of the ganglia cells with considerable pigment scattered in the protoplasm. Haemorrhage and leucocytic infiltration were noted in the connective tissue. For two weeks no recurrence was noted and then the attacks became more severe. Five weeks after the first operation the ganglia on the opposite side were extirpated. Slight attacks still occurred and were kept under control by drugs. As the main trouble seemed due more to chronic emphysema, the author decided to perform Freund's operation and resected the second to the fifth right costal cartilages. Respirations became normal and the emphysematous symptoms disappeared. Three months later he had an attack of bronchitis without any respiratory embarrassment. The bilateral resection of the cervical sympathetic has had no special consequence for the patient.

#### Early Operation for Cholecystitis.

H. BIESENBERGER (*Wiener Medizinische Wochenschrift*, October 18, 1924) maintains that operation as soon as possible after the first acute attack is best for all patients suffering from cholecystitis and cholelithiasis. When the condition is chronic a much higher mortality occurs owing to dense adhesions, empyema and possible perforation into the duodenum or peritoneal cavity. Out of one hundred and eighty patients operated upon he gives details of twelve whose illnesses were of long duration and were characterized by severe complications. Two of these died shortly after operation. The higher mortality and longer convalescence of these prove that early operation is best for all patients.

#### Fractures of the Shaft of the Femur.

WILLIS C. CAMPBELL AND J. S. SPEED (*Surgery, Gynecology and Obstetrics*, November, 1924) deal with the various aspects of fracture of the shaft of the femur. No set rule of thumb can be applied to all cases, each one constituting a problem in itself in regard to holding and obtaining the correct reduction. Much depends upon the shape of the ends of the fragments. The most difficult type to hold is the short, smooth, slanting break, which it is almost impossible to lock at the time of reduction and which is very liable to slip during the first week after the cast has been applied. The surgeon must often be satisfied in this type with 1.25 to 2.5 centimetres (half to one inch) overlapping and shortening, provided the antero-posterior alignment is good. It is better to have a leg 2.5 centimetres short than to subject the patient to the risks and uncertainty of an open reduction. Open reduction does not yield 100% cures by any means. If the patients are seen within the first twelve hours or if no undue swelling has taken place, reduction is done immediately and a plaster cast applied. There have been no serious consequences due to swelling after the cast has been applied. It has not been difficult to make sufficient extension to secure end-to-end apposition of the fragments when the muscles are thoroughly relaxed under anaesthesia. Compound fractures are kept on extension splints until all chance of infection has subsided. Fractures of the shaft in children properly treated give excellent results. Callus in children is usually exuberant and non-union even in the presence of infection or malposition is very rare. Young, growing bones have the ability to correct even considerable deformities. Treatment by immediate reduction and by the application of a plaster cast is the ideal method in children. In the case of adults the plaster cast method properly used gives as good as or better results than any other method. Simple fractures should be reduced immediately after injury. Early mobilization of joints and massage of the soft tissues is of great importance in all fractures, but satisfactory reduction and union

should not be endangered by too great an enthusiasm in this respect. Non-union is due chiefly to malposition. Open reductions are rarely indicated in acute fractures of the femur. The use of autogenous bone grafts is the best method of internal fixation in connexion with open reduction. It is always indicated in non-unions in adults. Fractures of the femur give long periods of disability and unless properly treated are liable to result in permanent impairment.

#### Recurrent Laryngeal Nerve Paralysis.

CHARLES H. FRAZIER (*The Journal of the American Medical Association*, November 22, 1924) discusses the anastomosis of the recurrent laryngeal nerve with the *descendens noni* nerve in cases of recurrent laryngeal paralysis. He has performed nine operations on six patients, in three the operation was carried out on both sides. He regards the results in three instances as very encouraging, function having returned. For this reason he states that he feels justified in continuing the procedure. The paralysis in nine instances followed the operation of thyroidectomy, in one it was the result of a gun-shot wound and in one it followed an attempt at suicide. Six of the patients had undergone the operation of tracheotomy and wore the tube permanently. The author states that it is necessary to perform the operation of anastomosis soon after the injury. It must be done while muscular tissue still persists and before the cords have undergone complete fibrosis. Moreover, the crico-arytenoid joint must be movable, otherwise nerve suture will certainly fail to restore function. There must also be an undamaged segment of the nerve a centimetre or so below the bifurcation. The question as to whether end-to-end or lateral anastomosis is to be used must be determined by the amount of nerve available. The author claims that if the patient is not benefited, he is no worse off than before the operation and that the dyspnea always improves even if phonation does not do so.

#### Sutures in Gastro-Enterostomy.

G. A. UPCOTT GILL AND H. B. JONES (*The Lancet*, October 4, 1924) discuss the dangers of the use of unabsorbable sutures in gastro-enterostomy. They quote Woosley in support of their contention that these sutures are frequently the cause of recurrent ulcers, especially gastro-jejunal ulcers. The patient whose case is described by the authors, was a soldier. He had undergone two previous operations, one for ruptured ulcer and the other for gastro-enterostomy. He complained of pain, vomiting, hæmatemeses and wasting. At operation a gastro-jejunal ulcer was found with a silk suture attached to its edge. The end of the suture was floating free in the stomach cavity. The ulcer and the anastomosis were excised and a new posterior anastomosis was made, thirty day catgut being used. The patient recovered and had relief from his symptoms.



## British Medical Association News.

### NOMINATIONS AND ELECTIONS.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

Coles, Joseph Harry, M.B., Ch.M., 1923 (Univ. Sydney),  
65, Edgecliff Road, Woollahra.  
O'Connor, Horace Herbert, M.B., Ch.M., 1923 (Univ. Sydney), Surrey Street, Epping.

### NOTICES.

THE SOUTH-WESTERN "DIVISION" OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION will hold a week-end meeting at Warrnambool, Victoria, from March 7 to March 9, 1925. A cordial invitation has been extended to all members of the Association to be present. The following programme has been arranged:

#### Saturday, March 7, 1925.

3 p.m. to 5 p.m.: Dr. C. H. Kellaway: "Special Methods in the Diagnosis of Hydatid Disease."  
Dr. Ivan Maxwell: "Diagnosis and Treatment of Asthma and Hay Fever."  
Discussion is invited on each paper.  
6 p.m.: Medical Dinner.  
7.30 p.m. to 10 p.m.: Dr. J. T. Tait: "Diagnosis of Urinary Stone and Hydronephrosis."  
Dr. Henry Laurie: "Diagnosis and Treatment of Rheumatoid Arthritis."  
Discussion is invited on each paper.

#### Sunday, March 8, 1925.

Morning: Visit to the factory of Nestlé and Anglo-Swiss Condensed Milk Company (Australasia), Limited.  
Afternoon: Motor car drives; good sea fishing is available.

#### Travelling Facilities.

A train will leave Spencer Street Station, Melbourne, at 6.30 p.m. on Saturday, March 7 and will arrive at Warrnambool at 1.18 p.m. A train for the return journey will leave Warrnambool at 7.40 a.m. on Monday, March 9 and will arrive at Spencer Street at 2.6 p.m. Holiday excursion fares will be available, the first class return rate being two pounds twelve shillings and threepence.

Motorists are assured of a pleasant journey. The road is good except between Geelong and Colac. Luncheon may be obtained at Camperdown or Terang. Seven hours should be allowed for the journey each way.

#### Accommodation.

Visitors are requested to make their own arrangements for accommodation at Warrnambool one week in advance. The Western Hotel and "The Mansions" are recommended. The tariff is fourteen shillings a day.

All members of the Branch, other than those of the South-Western "Division" who intend to be present, are asked to notify the Secretary of the Victorian Branch, East Melbourne, of their acceptance of the invitation and to signify not later than February 23 how they intend to travel.

## Medical Societies.

### MEDICAL DEFENCE SOCIETY OF QUEENSLAND.

THE ANNUAL MEETING OF THE MEDICAL DEFENCE SOCIETY OF QUEENSLAND was held at the B.M.A. Building, Adelaide Street, Brisbane, on December 11, 1924, Dr. A. B. CARVOSSO, the President, in the chair.

The following annual report of the Council of the Society was read and adopted on the motion of Dr. E. Sandford Jackson, seconded by Dr. D. A. Cameron.

### Annual Report of Council for 1924.

#### Membership.

The Society has now a membership of 247 as compared with 196 in 1923. During the year 58 new members were elected, five left the State and two deaths occurred. The Council sincerely regrets to record the death on April 9 of the President, Dr. T. R. McKenna, and also that of Thomas Davies, Emerald.

#### Office-Bearers.

Office-bearers elected for 1924 were as follows:

President: Dr. T. R. McKenna.  
Vice-President: Dr. A. B. Carvosso.  
Honorary Treasurer: Dr. A. H. Marks.  
Honorary Secretary: Dr. R. Marshall Allan.  
Auditor: Mr. R. G. Groom, F.C.P.A.

Council: Dr. J. Espie Dods, Dr. W. N. Robertson, Dr. W. F. Taylor, Dr. Wilton Love, Dr. A. Stewart, Dr. Kerr Scott, Dr. D. A. Cameron.

Owing to the death of the President, the Council elected Dr. A. B. Carvosso as President and Dr. J. Espie Dods as Vice-President. The vacancy on the Council was not filled.

#### Medico-Legal.

Your Council has to report the following cases dealt with during the year:

A member requested the support of the Society in a claim for damages owing to a fistula forming after a vaginal operation. The matter was taken up on behalf of the member and the affair amiably settled.

Another member asked for advice regarding the request of a solicitor for him to give evidence against a doctor for alleged negligence in treating a fracture. He was advised to inform the solicitor that he did not feel disposed to make a statement and no more was heard of the case.

A member who had issued a summons for recovery of fees, was threatened with a counter claim for damages to the patient's jaw following the use of tonsil clamps. Whilst the Society could not take action regarding the recovery of fees, it was decided to defend the counter claim. The latter was promptly withdrawn and the account settled in full.

A member had operated upon a girl five years ago for empyema. During convalescence the drainage tube was missed and could not be detected with a probe. No radiogram was taken as the member did not think it would be of use. About five years later the patient became ill and consulted another doctor, who had the chest radiologically examined. The tube was removed by operation, but the patient died. Her father approached the first doctor for expenses incurred for medical treatment and the funeral. After consulting our solicitors it was decided that though the Council could not take up the case, it was largely a matter of error of judgement on the part of the member in not having an X-ray examination of the chest at the time the tube was missed. In view of this the Council considered it advisable to offer £50 in full settlement of the claim through our solicitor. Failing this amount being sufficient, any balance must be paid by the member. The case was settled for £100, the member paying the balance.

#### Members Leaving the State.

The opinion of our solicitors was obtained on the status of members who had left the State and still desired to remain members of the Society. The opinion stated that though it was permissible for a member to so continue his membership, he could not require the Society to take steps outside Queensland to protect his interests.

#### Assets.

The total assets now amount to £1,664 19s. 9d.. During the year a further £150 was invested in Queensland Government Treasury Bonds and £200 in Commonwealth Treasury Bonds, while a fixed deposit of £100 in the bank which had matured, was renewed for a further period of two years.

R. MARSHALL ALLAN, Honorary Secretary.  
A. B. CARVOSSO, President.

MEDICAL DEFENCE SOCIETY OF QUEENSLAND.  
Balance Sheet as at November 30, 1924.

LIABILITIES.		ASSETS.	
Accumulation Account—	£ s. d.	Queensland Medical Land Investment Co., Ltd.,—	£ s. d.
Balance at December 1, 1923 .. ..	1,507 15 8	200 Shares paid to 10/- per share .. ..	100 0 0
Add—Surplus of Income over Expenditure for Year Ended November 30, 1924 .. .. .	157 4 1	Commonwealth of Australia, Treasury Bonds—	
	£1,664 19 9	£300 4½% 1925, £200 4½% 1927, £100 5% 1927, £200 6% 1934 at cost .. ..	800 15 0
		Queensland Government Treasury Bonds—	
		£200 5½% 1933-38 at cost .. ..	200 0 0
		National Bank of Australasia, Ltd.—	
		Fixed Deposits at 5% per annum—	
		£400, due June 1, 1925; £100, due April 29, 1926 .. .. .	500 0 0
		Cash at Banks on Current Account—	
		National Bank of Australia, Ltd. .. .. .	£45 10 7
		Commonwealth Savings Bank .. .. .	18 14 2
			64 4 9
	£1,664 19 9		£1,664 19 9

(Signed) A. H. MARKS, Honorary Treasurer.

Examined with the books, vouchers and securities and found correct.  
Brisbane, December 1, 1924.

ROY G. GROOM, F.C.P.A., Auditor.

MEDICAL DEFENCE SOCIETY OF QUEENSLAND.  
Honorary Treasurer's Statement for the Year Ended November 30, 1924.

RECEIPTS.		PAYMENTS.	
1923.	£ s. d.	1924.	£ s. d.
December 1—		November 30—	
To Cash at Banks and in Hand—		By Rent .. .. .	£5 0 0
Credit Balance, National Bank of Australasia, Ltd., Brisbane .. .. .	£94 11 5	„ Exchange and Bank Charges .. .. .	15 0
Credit Balance, Commonwealth Savings Bank, Brisbane ..	110 15 7	„ Secretary's Salary ..	12 0 0
Cash in Hand .. ..	2 8 8	„ Audit Fee .. .. .	2 2 0
	207 15 8	„ Printing and Stationery .. .. .	7 0
1924.		„ Postage and Duty Stamps .. .. .	1 9 8
November 30—		„ General Expenses ..	12 0
To Entrance Fees—		„ Federal Income Tax to November 30, 1923 ..	1 13 0
58 New Members at £1 1s. each ..	60 18 0	„ Wreath (late Dr. McKenna) .. .. .	1 1 0
„ Subscriptions .. .. .	129 1 6		24 19 8
„ Exchanges .. .. .	2 4 0	„ Legal Expenses .. .. .	78 17 6
„ Dividends and Interest—		„ Queensland Government Treasury Bonds, 5½%—	
Queensland Medical Land Investment Co., Ltd.: Dividend on 200 Shares .. ..	£5 0 0	£100 5½% 1933-38 .. .. .	100 0 0
Federal War Loan—		„ Commonwealth Treasury Bonds, 6%—	
Interest on £500, 4½%, £22 10s.; Interest on £100, 5%, £5 .. .. .	27 10 0	£200 6% 1934 at £99 17s. 6d. .. ..	£199 15 0
National Bank of Australasia, Ltd.—		Brokerage .. .. .	1 0 0
Interest on £500 Fixed Deposit, 5% .. ..	25 0 0		200 15 0
Queensland Government Treasury Bonds—		„ Cash at Banks and in Hand—	
Interest on £100, 5½%, 12 months, £5 10s.; Interest on £100, 5½%, from December 18, 1923, to June 30, 1924, £2 19s. 2d. .. .. .	8 9 2	Credit Balance, National Bank of Australasia, Ltd., Brisbane .. .. .	£45 10 7
Commonwealth Savings Bank—		Credit Balance, Commonwealth Savings Bank, Brisbane ..	18 14 2
Interest to June 30, 1924 .. .. .	2 18 7		64 4 9
	68 17 9		
	£468 16 11		£468 16 11

### Financial Statements.

The balance sheet and treasurer's statement, as shown on page 197, were presented and adopted on the motion of Dr. A. H. Marks, seconded by Dr. D. A. Cameron.

### Election of Councillors.

Dr. A. H. Marks, C.B.E., D.S.O., and Dr. R. Marshall Allan, M.C., retiring councillors, were unanimously re-elected. Dr. A. G. Anderson was appointed a member of the Council to fill the vacancy caused by the death of Thomas Richard McKenna.

The President commented on the large increase in membership during the year and also stated that in view of the great benefit and protection of the Society to the profession and of the small subscription charged, it was hard to understand why all medical men who were eligible, did not join.

On the suggestion of Dr. E. Sandford Jackson it was resolved to circularize again non members who were eligible.

## Correspondence.

### THE TREATMENT OF EXOPHTHALMIC GOITRE.

SIR: In a leading article in the January 10, 1925, edition of your journal, there is reference to certain work by Marine on goitre. In this the following statement is made: "Similarly the thesis that endemic goitre and Graves's disease are in some inexplicable way produced by the effect of some distant infective focus, lacks all scientific support." While fully realizing that the lack of iodine plays a certain part in the production of goitre, I cannot resign the contention that infections are the main cause. What exactly are we to understand by the expression "scientific support"? Is not the fact that one can produce a number of cases of exophthalmic and thyrotoxic goitre cured of their trouble to be reckoned as scientific evidence?

That iodine is not essential to the cure of these cases is shown by the fact that of all these cured cases not a single one of toxic goitre or Graves's disease has had iodine in any form and has got well in spite of it. For some years I have not had a case which has not responded well to treatment by removal of focal infections and I have no hesitation in telling my patients that their chances of getting well are very good. In my out-patient department at St. Vincent's Hospital I must always have from fifteen to twenty cases of toxic goitre under treatment as well as numbers of private cases and I am experiencing no difficulty in curing them. On various occasions I have shown cases at the different clinical meetings and have offered to demonstrate the treatment of these cases at any of the public hospital.

My clinic is always open for any interested in the matter to come and see these cases for themselves. There are various facts which are the cause of failure with men who are working on these lines. One is the varying opinion as to what is an infected tonsil and what is not and the other is the lack of recognition of sinusitis, as it is present in very nearly all these cases. Anything short of complete eradication of the infection is useless. Chronic appendicitis is at times overlooked and may be present without giving signs for some years. Tubal and cervical infections are also not given the attention they should have.

On looking back in the past I can trace these infections as being the ones in which I have failed in effecting a cure.

That there are various factors in the causation I am well aware and have expressed my views on this subject in a paper read before the late congress. There is no single factor responsible for goitre, but a combination. The iodine element is only one link in the chain. My earnestness in trying to establish these facts prompts me to write this letter, as what is being done by me can be done by others. My cases are open for all to see and criticize. It is a great pity that there is not some

sort of tribunal to which one could submit views and treatment, as at the present time it is nobody's business to bother about investigating the soundness or otherwise of such views and that unless they have the backing of some big institute they receive scant attention.

In spite of Marine's contention, I still maintain my ground. I should like to know on what grounds he disproves it. To reproduce the same conditions in an animal would be very difficult.

One would have to get one infected for some years with tonsillar or nasal infection, preferably both, and would have to so manage as to see that its immunity mechanism had failed to destroy the organism on entering the blood stream and also to see that for the production of exophthalmic goitre there was some involvement of the superior cervical ganglion. If such conditions could be reproduced artificially I believe Graves's disease could be simulated.

One must always bear in mind that there may be ample iodine for the normal metabolism of the thyroid, but not sufficient for excessive thyroid activity. Then the initial factor would not be the lack of iodine, but the thing which produced the need for more iodine. If the need of iodine were such a dominant factor, it would not be possible to cure these cases without it in some form, as it is they are being cured without it. This alone must put the iodine theory second place.

A month or so ago I wished to get Dr. Kellaway, Director of the Walter and Eliza Hall, interested in these cases and showed him a case which he was satisfied was a typical example of exophthalmic goitre. This case I said I would treat and he could see after. She was a typical case of Graves's disease of a very bad type with vomiting, excessive tremor and a pulse of 148. She had infected sinuses and tonsils. She was in very poor circumstances. I first treated her sinusitis and within a week or two that was well; the improvement following this enabled her to stand tonsillectomy, which was done by Dr. Eadie at the Melbourne Hospital. It was at this stage Dr. Kellaway saw her. She left the hospital within forty-eight hours of her operation. She was, as one would expect, very knocked out by the infection following tonsillectomy and weighed about that time eight stone five pounds.

She was as bad as ever for a little while after the operation with a recurrence of vomiting. She went back home to Kilmore, where she had to manage as best she could. This was about July 1, 1924. She steadily improved and has continued to do so ever since. She came in to see me on January 19, 1925. Her weight was ten stone eight pounds. She tells me she has lost all her palpitation and when at home her pulse is quite steady and normal; when she is at all excited, it goes a little fast. She is doing all her own house work and is feeling well in every way. She still has some enlargement of the thyroid which past experience has shown will not subside for some months to come and she has some obvious exophthalmos, which will also gradually improve now all her symptoms are reduced. She has had no iodine and has been under the most adverse circumstances for getting well and in spite of this we are told most infactically<sup>1</sup> that the relationship between Graves's disease and some distant infective focus lacks scientific evidence. Having done so many of these cases, I made the statement that at least 80% can be cured by these means and offered to demonstrate the method of treatment. There may be a few cases in which it is impossible to remove the focus.

I do not profess that this patient is completely cured, as she still has some thyroid enlargement, but I am prepared to say that within the next six months or so that the thyroid will slowly reduce; meantime she is enjoying good health. This was a test case and what was done in this case can be repeated in others.

Yours, etc.,

SYDNEY PERN.

12, Collins Street, Melbourne.  
January 21, 1925.

<sup>1</sup> This word is unknown to us.—EDITOR.



### MENINGITIS: A NEW TREATMENT.

SIR: In the report of the proceedings of the Melbourne Pædiatric Society (THE MEDICAL JOURNAL OF AUSTRALIA, November 22, 1924, page 564) mention is made of cure of a case of meningitis and attention is drawn to the extreme rarity of recovery in all forms of this disease. Since June of this year all children with meningitis admitted under me to the Royal Alexandra Hospital for Children, Sydney, have been treated by lavage of the *cisterna magna* and the exhibition of suitable sera. Of the nine patients treated (two having been kindly referred to me by my colleagues), two have recovered and show no sign of mental or nervous defect. One since the illness has survived a severe attack of bacillary dysentery and the other has been operated upon for septic tonsils and adenoids. Of the remaining seven, three were moribund when treatment was begun and three were suffering from tuberculous meningitis. The seventh held out so long as to give hopes of recovery, but internal hydrocephalus developed and resulted fatally in spite of tapping and lavage of the ventricles.

Case 1.—B.P., *etatis* seven years, was admitted on July 29, 1924, and was discharged cured on September 28, 1924. Active treatment began on July 30, 1924, and ceased ten days later. The child was kept under observation for several weeks and then discharged. Pneumococci were present in the cerebro-spinal fluid.

Case 2.—C.P., *etatis* eight months, was admitted on September 19, 1924, and was discharged on October 11, 1924, cured. Active treatment lasted for sixteen days. Meningococci were present.

The treatment consisted in lavage of the *cisterna magna* with 0.3% saline solution about every second day with lumbar puncture on alternate days, if considered necessary, and the administration of the appropriate serum in ten to thirty cubic centimetre doses, either into the cistern or intra-muscularly or both. The lavage was carried out after puncture through the *foramen magnum* with an ordinary ten cubic centimetre metal and glass syringe and a two-inch needle of fairly large bore. The operation was performed under anæsthesia and lasted from thirty to forty-five minutes.

Difficulty was only experienced when head retraction was severe, though some patients were more difficult than others. In small babies, when lumbar puncture gave a dry tap, fluid was easily obtained by cistern puncture and I now personally use this method of procuring cerebro-spinal fluid in all cases.

Though the number of cases is small, I have been decided in this early mention of the treatment by the abovementioned report in your issue of November 22.

From a study of the cases several conclusions may be drawn. Treatment must begin as soon as a diagnosis is made, without waiting for examination of the fluid by culture or for the fluid to become turbid. Lavage at first must be performed not less often than every second day. When there is severe head retraction, that is the basal type of the disease, the patients are more amenable to treatment than when the disease has commenced at or spread to the vertex or Sylvian fissure.

The duration of active treatment in the two children who recovered, was relatively very short. Both children at time of writing are well both physically and mentally.

The operation is singularly devoid of risk.

Yours, etc.,

M. J. PLOMLEY, M.B., Ch.M.,

Honorary Physician, Royal Alexandra Hospital for Children.

233, Macquarie Street, Sydney.

December 15, 1924.

### THE ALCOHOLIC QUESTION.

SIR: The letter of Dr. Richard Arthur on the question of alcohol is opportune, seeing that the Royal Commission on Public Health is to inquire into: "(c) The prevention of the outbreak, development or spread of disease in the Commonwealth" and "(f) . . . child welfare."

One set of statistics (*The British Medical Journal*, May 31, 1924) indicates that about 30% of males from an

average population are heavy drinkers (according to the definition there given) and that their average duration of life is seriously less than that of the not heavy drinkers. The evidence, statistical, clinical and police court, indicates that alcohol is a not inconsiderable factor in producing disease and disability. I think Dr. Arthur's suggestion well worth following up.

Yours, etc.,

Kyneton, Victoria.

J. HORACE DOWNING.

January 24, 1925.

### THE ABUSE OF THE UTERINE CURETTE.

SIR: In the suggestive address on the use and abuse of the uterine curette by Dr. Fourness Barrington, I note that he recommends the use of conical dilators. I have always practised and taught the use of cylindrical in preference to conical rigid dilating instruments for any region. With the cylindrical dilator one feels resistance, as at the internal os, which gradually yields and the dilator under control passes comfortably into the uterine cavity. With the conical instrument one is against resistance all the time and it seems to me that the accident of perforation of the softened uterine wall is much more likely to happen with this type of instrument. For a similar reason I do not possess any dilating urethral sounds, as I feel much safer from the risk of creating a false passage by using metal catheters. I would go so far as to say that no rigid dilating instrument should be of conical shape.

Yours, etc.,

D. MURRAY MORTON.

37, Collins Street, Melbourne.

January 26, 1925.

### "THE ANATOMY OF PROCIDENTIA UTERI."

SIR: A letter in the journal of January 31, under this heading from Dr. Nyulasy contains the statement: "Dr. Worrall, of Sydney, thought fit to condemn the operation; yet in discussing Mr. Maguire's contribution he now states that 'no abdominal operation, however radical, would cure prolapse unless the fibro-muscular tissue were again shortened and brought together in front of the cervix and the fascia with the levatores ani re-united in the middle line.'" Looking up the Transactions of the 1914 Congress I find what I condemned was an intra-abdominal operation in which "the utero-vesical pouch is opened (from above), the bladder thrown down from the uterus and the cardinal ligaments looped on to the anterior uterine surface." I said I felt sure if the operation were generally adopted it would result in many deaths. Professor Watson who followed me in the debate, said the operation was not one to recommend to the occasional operator and that he would not advise any of his female relatives to submit to it unless possibly Dr. Nyulasy himself were present to perform it. The quotation from my remarks upon Mr. Maguire's paper referred to vaginal operations for procidentia in which I advocated excision of the vaginal vault and uniting the parametria in front of the amputated cervix. Quotations without the context are apt to be misleading.

Yours, etc.,

Sydney.

RALPH WORRALL.

February 2, 1925.

### Medical Prizes.

#### THE SOPHIE A. NORDHOFF-JUNG CANCER PRIZE.

AN announcement has been made through the Department of Biology, Georgetown University, Washington, D.C., to the effect that the Commission for the distribution of the prize for cancer study founded by Dr. Sophie A. Nordhoff-Jung in agreement with the foundress, has resolved to award the prize from now on at two-yearly intervals. The amount of the prize will be one thousand dollars or double the sum heretofore allotted. The next award will be made in 1926.

## Congresses.

### THE HEALTH ASSOCIATION OF AUSTRALASIA.

THE ANNUAL CONGRESS OF THE HEALTH ASSOCIATION OF AUSTRALASIA will be held at the Town Hall, Melbourne, from Monday, October 5, to Friday, October 9, 1925. Representatives of the various State Branches of the Association will meet to discuss the best methods of securing health and preventing disease. Sir James Barrett, K.B.E., C.B., C.M.G., is the President of the Executive Committee and Dr. Frank R. Kerr, D.S.O., is the Honorary Secretary. Further details will be published at a later date.

## Books Received.

- INTERNAL SECRETION AND THE DUCTLESS GLANDS, by Swale Vincent, LL.D., D.Sc., M.D., M.R.C.S., L.R.C.P., F.R.S. (Edin.) F.R.S. (Can.), F.Z.S.; Third Edition; 1924. London: Edward Arnold and Company. Royal 8vo., pp. 463, with illustrations. Price: 25s. net.
- LANDMARKS AND SURFACE MARKINGS OF THE HUMAN BODY, by L. Bathe Rawling, M.B., B.C. (Cantab.), F.R.C.S.; Sixth Edition; 1924. London: H. K. Lewis and Company, Limited. Demy 8vo., pp. viii. + 98, with 36 illustrations. Price: 7s. 6d. net.
- LANG'S GERMAN-ENGLISH DICTIONARY OF TERMS USED IN MEDICINE AND THE ALLIED SCIENCES, Edited and Revised by Milton K. Meyers, M.D.; Third Edition, Enlarged; 1924. Philadelphia: P. Blakiston's Son and Company. Royal 8vo., pp. viii. + 618.
- MODERN VIEWS ON THE TOXÆMIAS OF PREGNANCY, by O. L. V. de Wesselow, M.B. (Oxon.), F.R.C.P., and J. M. Wyatt, M.B. (London), F.R.C.P.; Modern Medical Monographs, Edited by Hugh Maclean, M.D., D.Sc.; 1924. London: Constable and Company, Limited. Sydney: Angus and Robertson, Limited. Demy 8vo., pp. 99.
- PHYSICAL CHEMISTRY FOR STUDENTS OF MEDICINE, by Alexander Findlay, M.A., D.Sc., F.I.C.; 1924. London: Longmans, Green and Company. Demy 8vo., pp. 227, with 39 figures. Price: 8s. 6d. net.

## Medical Appointments.

Dr. Hubert Melville Jay (B.M.A.) and Dr. Leonard James Fellow (B.M.A.) have been appointed Members of the Board of Optical Registration under the *Opticians Act, 1920*, South Australia.

Dr. Annie Mildred Mocatta (B.M.A.) has been appointed Honorary Clinical Assistant to the Pathologist at the Adelaide Hospital.

Dr. John Smith Proctor (B.M.A.) has been appointed Temporary Honorary Assistant Physician at the Consumptive Home, Adelaide Hospital.

Dr. Henry Kenneth Fry (B.M.A.) has been appointed as an Official Visitor to the Mental Hospital at Parkside, South Australia.

Dr. Joseph Ruskin Cornish (B.M.A.) has been appointed Acting Deputy Superintendent, Parkside Mental Hospital, South Australia.

Dr. Henry Joseph Windsor (B.M.A.) has been appointed a Member of the Dental Board, Queensland.

Dr. Ernest William John Ireland has been appointed a Justice of the Peace for the District of Launceston, Tasmania.

## Medical Appointments Vacant, etc..

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xvi.

AUSTIN HOSPITAL, HEIDELBERG, VICTORIA: Senior Resident Medical Officer.

QUEEN VICTORIA HOSPITAL, MELBOURNE: Medical Superintendent.

ROYAL HOSPITAL FOR WOMEN, PADDINGTON, SYDNEY: Junior Resident Medical Officer.

## Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C..

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 24, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited Mutual National Provident Club. National Provident Association.
QUEENSLAND: Honorary Secretary, B. M. A. Building, Adelaide Street, Brisbane.	Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Honorary Secretary, 12, North Terrace, Adelaide.	Contract Practice Appointments at Renmark. Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

## Diary for the Month.

- FEB. 24.—New South Wales Branch, B.M.A.: Medical Politics Committee: Organization and Science Committee.
- FEB. 25.—Victorian Branch, B.M.A.: Council.
- FEB. 25.—Section of Surgery, New South Wales Branch, B.M.A.
- FEB. 27.—Queensland Branch, B.M.A.: Council.
- MAR. 3.—New South Wales Branch, B.M.A.: Ethics Committee.
- MAR. 3.—Tasmanian Branch, B.M.A.: Council.
- MAR. 4.—Victorian Branch, B.M.A.: Branch.
- MAR. 4.—Section of Obstetrics and Gynaecology, New South Wales Branch, B.M.A.
- MAR. 6.—Queensland Branch, B.M.A.: Branch.
- MAR. 10.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
- MAR. 10.—Tasmanian Branch, B.M.A.: Branch.
- MAR. 12.—Victorian Branch, B.M.A.: Council.
- MAR. 12.—South Australian Branch, B.M.A.: Council.
- MAR. 13.—Queensland Branch, B.M.A.: Council.
- MAR. 17.—New South Wales Branch, B.M.A.: Medical Politics Committee: Organization and Science Committee.
- MAR. 17.—Tasmanian Branch, B.M.A.: Council.
- MAR. 18.—Western Australian Branch, B.M.A.: Branch.
- MAR. 18.—Western Medical Association, New South Wales.
- MAR. 24.—New South Wales Branch, B.M.A.: Council (Quarterly).

## Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, B.M.A. Building, 30-34, Elizabeth Street, Sydney. (Telephone: B. 4635.)

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